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SICK NURSING

by

H. DRINKWATER, M.D.

Author of "First Aid to the Injured,"
"Food in Health and Disease," etc.

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SICK NURSING

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AUTHOR'S PREFACE

This book is designed as a manual for the use of Students attending lectures in connection with the St John Ambulance Association and the Evening Continuation Classes.

I have to thank Messrs Down Brothers and Messrs Arnold & Sons for their kind permission to use some of the illustrations of nursing sundries from their instrument catalogues.

H. DRINKWATER.

Wrexham, *December* 1906.

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NURSING

THE SICK ROOM

Selection of a Sick Room.—When a case of illness occurs one of the first questions to decide is, "Where shall the patient be nursed?" that is, "What room shall he occupy?"

In a very large proportion of cases the patient is bound to upy his ordinary bedroom.

Sometimes it saves a great deal of trouble if the "parlour" temporarily made into a bedroom for the patient, especially where he has to be attended to by his wife, who at the same ime has her usual household duties to perform. This is more especially the case amongst the working-class population.

Whenever circumstances permit the use of a room at the top of the house, this is the best position.

There are four points that must receive due consideration in selecting a room, and these are:—

First, its size; secondly, its position; thirdly, its aspect; fourthly, its ventilation.

1. *The Size of the Room.*—Where the case is at all likely to last some considerable time, the best room—that is the largest—should be made into the bedroom.

A certain quantity of air must pass through the room—3000 cubic feet per hour. From this fact it is clear that the smaller the room the more rapidly the air must pass through it—and the more likely is the patient to complain of draughts, and in endeavouring to stop the draught the ventilation is likely to become imperfect. A sick room for a non-infectious case should contain at least 1000 cubic feet of space.

The capacity or size of a room is ascertained by multiplying together the length, breadth and height.

Suppose the length be 12½ feet; the
width 10 feet,
height 8 feet,
this room will hold 1000 cubic feet of air. Something must be deducted for the furniture, for if it is full of furniture it cannot be full of air too. Such a room will require renewal of air three times each hour, and this can usually be accomplished without causing draughts. If the room holds 3000 cubic feet, and the air is renewed once an hour, one patient can occupy it: if renewed twice an hour, two patients; and if three times an hour, three patients can be placed in it.

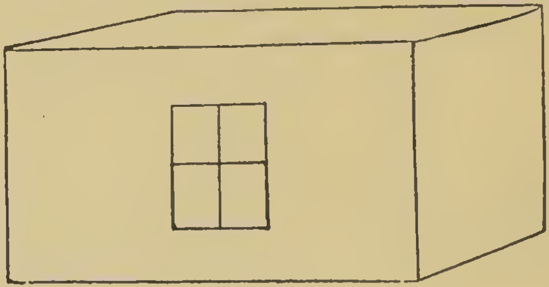

FIG. 1.

The room must be sufficiently large and well ventilated for the following reasons:—

(1.) More poisonous products are given off during sickness than in health.
(2.) It is generally occupied *continuously* day and night.
(3.) For part of the time it is occupied also by those in attendance on the patient. During health there is a good part of the time when no one occupies the room, so that it is *then* easy to ventilate it.

2. *The Position.*—It should be in the quietest part of the house; therefore generally at the back and near the top. The air at the top is purer than that in any other part of the house

3. *The Aspect*, by which is meant the point of the compass towards which its window looks—north, east, south, or west. The window should look to the south or south-west in order that it may have the full benefit of the sunshine. Not to the east because the morning sun disturbs the patient, and in the spring and late winter the east winds are too cold to allow of the window being kept sufficiently open.

A north aspect may be chosen for brain and eye cases that cannot bear a strong light.

For bronchitis, croup, and such-like complaints, the aspect *must* be south or west.

4. *The Ventilation.*—The room must be *capable* of being properly ventilated : it must have a window that will open, and a fireplace that is not blocked up.

The *Window* should be large and not covered with heavy curtains that keep out both light and air. Lace *curtains* are the best. Heavy curtains may be drawn across at night in very cold, windy weather.

Blinds.—Holland blinds on rollers are the best. Venetian blinds are not to be recommended.

The window must be made to open top and bottom. Such windows are best. French windows should open *outwards.* If the window cannot be opened, a circular valve ventilator should be put in one of the panes, or a ventilator put in the wall. Fresh air *must* be admitted direct from the outside. The window must be kept clean.

The *Fireplace* serves two purposes :—

(*a*) Warming,
(*b*) Ventilation.

(*a*) *Warming.*—A fire warms the room, but it does more, it extracts air from the room, so that there is a *continuous* passage of air up the chimney, and fresh air is drawn into the room to take the place of what has just gone up the chimney. The air enters the room by the window, the door, and any chink that it can pass through. Even in warm weather it is generally advantageous to keep a *small* fire in the grate for the sake of the ventilation. Smoking chimneys are due to in-sufficient draught, and are at once cured by opening the window or door a little more. If a strong wind is blowing it will often force air down the chimney if there be only a small fire.

Blocking of the grate or flue is perhaps the commonest and most serious mistake made by all classes of people—the rich and the poor alike. There cannot be good ventilation in a room with the flue choked up, unless the window is wide open, and people who block up the chimney do not open the window. If a down draught is felt on the bed coming from the chimney, place a screen in front of the grate.

The sense of smell is soon dulled, and whilst living in a room one does not notice the air becoming foul. Very many cases of illness are prolonged indefinitely owing to the patient constantly breathing bad air: in fact, re-inhaling the poisons produced in and given off from his own body, and many never recover at all owing to the same cause.

Test.—If the air of the room feels fresh on first entering it from the outside air the ventilation is all right: if it feels foul, if there is a distinct odour, the ventilation is not right.

If the case is one of an infectious disease, such as scarlet fever, one of the most important considerations is to select a room as far as possible from those occupied both day and night by any other member of the family, and if possible one at the end of a passage, or one that communicates with the outside of the house directly, without having to pass through any other room.

There is also *special* need for good light and free ventilation.

Preparation of the Sick Room.—In ordinary non-infectious illness it is best not to disturb the room more than is absolutely necessary. Most of the ordinary furniture may be left in, provided it is not too bulky, and does not interfere with ventilation and proper attendance on the sick person.

Cleaning.—The walls should be dusted, the floor well swept, and washed if there is time for it to dry thoroughly before the patient enters; otherwise it must only be rubbed over with a damp cloth.

Furniture.—Remove superfluous things, but do not make the room look bare. *In infectious cases* the room must only contain necessaries. The carpet must be taken up, a small strip being left at the side of the bed and another by the hearth. No drapery, such as bed hangings, heavy curtains, rugs or toilet covers, must be left. Chests of drawers should be removed. Nothing that will spoil when being disinfected should be left in the room.

A *Fire* should be lighted as soon as the room is selected and the temperature maintained at about 60° (not above 65° nor below 55°). This must be observed by means of a *thermometer* placed near the patient's head and on the same level. It will show the temperature of the air that the patient breathes, which may be several degrees warmer or cooler than the air of other parts of the room.

A thermometer in a case to hang on the wall costs one shilling. It consists of a hollow glass tube closed at each end. The lower end is expanded into a "bulb." The rest is called the "stem," and has a uniform thickness throughout its whole length (Fig. 2). The bulb contains quicksilver (mercury), a substance *very* sensitive to variations in temperature. It expands and therefore rises in the tube as the temperature or heat of the air rises and sinks down when the air gets cooler.

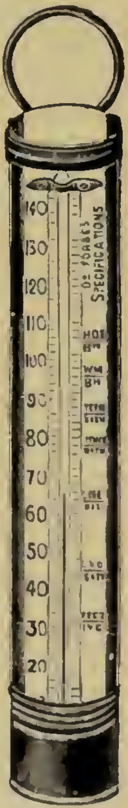

FIG. 2.

The thermometer is "read" by noticing exactly the point to which the upper limit of the mercury reaches.

The stem is marked in "degrees," or the degrees may be marked on the metal or wooden frame to which the glass is fixed.

In figure 2 the mercury is shown standing at 66 degrees—generally written thus, 66°, the little circle meaning "degree." It will be noticed that each short line indicates 2°.

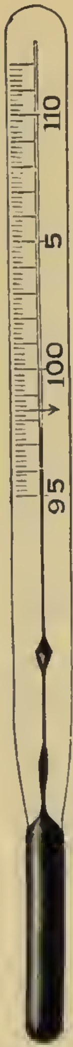

FIG. 3.

There is another kind of thermometer called a "clinical thermometer," used for taking the patient's temperature: this is composed of glass only, and has the markings on the glass (Fig. 3).

The temperature ordinarily needed in the sick room is from 55° to 65°.

Exceptions: in croup, bronchitis, pneumonia, and for old people, it is advisable to have the temperature of the room up to 68° or 70°.

In the clinical thermometer, the hollow in the stem is *very* narrow, so that the mercury rises more for each increase in heat than it does in the wall thermometer, in which the tube is much broader. It is thus possible to record not only degrees, but fractions of a degree. It is graduated from 95° to 110°. Each degree is subdivided by four short lines into five spaces, each space or interval thus being $\frac{1}{5}$ or $\frac{2}{10}$ of a degree.

Suppose the mercury reaches 98, the temperature of the patient is 98°; if it goes to the next *short* line it is 98·2°, called "ninety-eight point two," or "ninety-eight decimal two," the two being $\frac{2}{10}$ or $\frac{1}{5}$ of a degree. At the next line it will be 98·4°, the next 98·6°, the next 98·8°, and the next $\frac{2}{10}$ rise brings it to 99°. Half-way between the short lines gives the odd numbers: between ·2 and ·4 it is ·3, and so on.

The Bed.—The bedstead should be of iron, 6½ feet long by 3½ feet wide: if bigger than this, it is difficult for the nurse to get to the patient for all purposes.

Bedding.—A feather bed should not be used; it retains perspiration; the air stagnates around the body, the inside of the bed becomes very foul and gives off (after long use) noxious emanations; bed-sores are very apt to form; the patient sinks into a hollow, and it is difficult for the nurse to keep him clean; it renders nursing altogether difficult, especially if the patient be heavy or helpless. The mattress should be of horse-hair. A straw or chaff one is best for fever cases: it can afterwards be burnt and easily replaced. The tick need not be burnt, as it is easily disinfected. The hair mattress should rest upon a spring mattress. If it sinks down a little in the middle, place a pillow between it and the spring mattress.

An equally good and cheaper mattress is made of "fibre" or "coir."

Bed-clothes.—Sheets should be of cotton or twill calico. Linen should only be used, if at all, in the very hottest weather. There are two sheets, the upper or top, and the lower or bottom one.

The lower sheet should be large enough to tuck under the mattress at the foot and sides of the bed.

For old people, a blanket may be used below the bottom sheet, but it must be stretched quite free from wrinkles and secured to the mattress with strong safety pins.

Blankets: the number of these will vary with the season and the patient. One should be at hand to use in various emergencies, and if the patient is feeling chilly but not actually feverish. New blankets are warmer than old ones. The counterpane should be thin; it is not as warm as a blanket of equal thickness, and is heavier.

Eider-down quilts are not to be recommended.

A "*Protector*" is required in many cases. It consists of waterproof material (rubber or American cloth, or a table oilcloth) and in the absence of this several folds of newspaper: this is covered by the *draw-sheet*, consisting of a blanket or stout sheet doubled up so as to form a square large enough to reach across the bed, and from just below the patient's shoulders to the knees. At the sides it must be secured to the mattress by safety-pins.

When wet or soiled it is easily replaced by a fresh one without the lower sheet being disturbed, *Exceptions with regard to bed and bedding*—

(*a*) In rheumatic fever (or "acute rheumatism") the patient should lie next the blankets, which should be new. Also in cases of acute kidney disease; after being restored from drowning; after alcohol and other poisons which lower the patient's temperature.

(*b*) A *fracture-bed* has to be arranged for fracture of the thigh.

Three strong wooden laths are placed below the mattress, across the bedstead, just long enough to reach from side to side: one at the level of the middle of the patient's back, one under the hips, and one under the knees. They prevent the bed sinking in, and add to the patient's comfort. They are not required with the wooden bedstead.

The head of the bed should stand a foot from the wall, and the nurse should be able to get readily to both sides.

If curtains are used, they must be of light gauzy material. No canopy must be used. Nothing is to be stored below the bed: in some houses the space below the bed is used as a lumber-room.

Position in the Room.—Place the bed where the patient will get the fullest benefit from ventilation without undue exposure to draughts. The side should be next the window; if the foot is directed to it the patient may be annoyed by the light being constantly in front of his face, and when convalescent he cannot read so conveniently.

This figure (4) shows a convenient arrangement of a bedroom.

The window is so placed as to light the whole room, and the patient can turn his face or his back towards it as he wishes.

In very hot weather the bed may be placed in the centre of the room. The fireplace is so far from the window, that air entering at the window must circulate throughout the room before it can escape by the chimney.

The corner marked N will hold a small bed for the nurse.

As a rule, air passes in a nearly direct line from the window and door towards the fire-place.

In typhus, typhoid and small-pox it is well to place the bed in such a position that the incoming air will pass over the patient on its way to the chimney.

Utensils.—All chamber utensils should be of glazed earthenware. Metal (iron or zinc) should not be used.

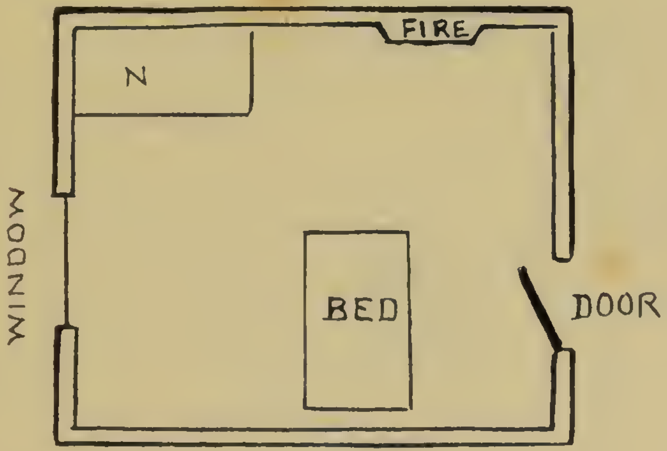

FIG. 4.

A slop-pail should have a well-fitting lid. Bed-pans should have lids. Urinals of glass are best, but an ordinary jam jar will do for the male, and a soup-dish for the female.

They must be kept quite clean, and after being scalded should have some carbolic powder sprinkled inside. Excreta must not be carried from the room in uncovered receptacles; if they are kept for the doctor's inspection, keep them in an adjoining unoccupied room and well covered.

All chamber utensils should be taken to the water-closet to be emptied, and well washed before being brought back.

They should not be kept under the bed unless it is positively the only place for them.

The *Carpet* should never cover the whole floor. It retains dust and infectious particles, and is very difficult to keep clean.

It should not go under heavy articles of furniture, nor under the bed.

It should be brushed every day with a carpet-sweeper, or a broom covered with a damp cloth.

The wooden flooring should be polished with beeswax and turpentine.

Chairs should be plain, with wooden seats. Two are generally sufficient.

There should be a large *comfortable* armchair for the nurse who is on night duty. During convalescence a couch is useful.

A *Screen* may be required: it can be made out of a clothes-horse covered with a blanket or sheet.

A *Bedside Table* on wheels, that can be adjusted to various heights and angles, is convenient, when the patient can rise up in bed and feed himself, or is able to read. One to rest on the bed may be used: this should be about 2 feet long and 10 inches broad. It can readily be made by a local joiner, out of plain wood (Fig. 5).

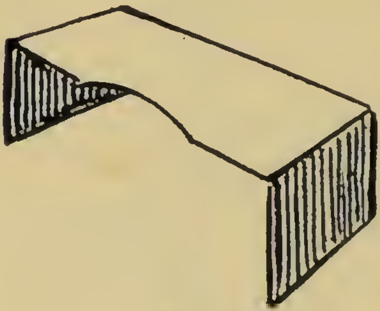
FIG. 5.

A *Small Table* should be reserved for medicines and other things required for the patient's own use.

A few *Flowers* make the room look bright, and are pleasing to the patient. They have a healthy effect on the air during the daytime, owing to the action of sunlight. They should be taken from the room for the night.

The Fire.—Fresh coal should be added when the patient is awake. Have little lumps or heaps wrapped in paper ready at hand to put on when the patient is asleep.

A wooden poker may be used without making much noise,

Ventilation of the Sick Room.—This must be under the nurse's supervision.

There must be a proper inlet for fresh air and an outlet for foul air.

The Inlet.—The proper inlet is one that admits air directly from the outside: it is therefore either the window or some special form of ventilator fixed in the wall. In the great majority of cases the air has to be admitted by the window. The door is not the place where most of the air should enter. That coming in at the door has already circulated through part of the house, and it is often very impure in consequence.

The Size of the Opening.—The more rapidly the air enters, the smaller is the aperture needed to admit a given quantity of air.

Air travelling at the rate of three feet per second is the highest speed that can be borne without feeling a draught. Suppose the window sashes are separated $\frac{3}{4}$ of an inch, and the sashes are 32 inches wide, then the space through which the air is entering will be 24 square inches ($32 \times \frac{3}{4} = 24$). At three feet per second, this will supply 1800 cubic feet per hour.

If the air is directed upwards by entering only at the top of the window, it will be warmed by mixing with the warm air of the upper part of the room, and in this case may enter in larger volume without being felt as a draught.

If the air does not enter by the window, it comes mostly under the door, in cold weather, chilling the feet. A cold draught below the door is cured by opening the window more.

The best plan as a rule is to *lower the upper sash*: this lets the fresh air enter in an upward direction between the two sashes, and generally serves to admit air at the top as well, at anyrate if the wind, however slight, is blowing against the window. In tranquil weather the air comes in between the sashes, and often the foul air passes out at the top.

The *lower sash* may be raised, thus admitting air above and below: if a draught is felt from the lower opening, the space should be filled in by a board resting on the window frame against the sash, or placed below the sash, which is to be shut down upon it.

If a strong wind is blowing or the window fits badly, it may not need to be opened at all; but with these exceptions, *the window should never be completely closed either during the day or night.*

When the window will not open, the door must be used for the inlet, and an attempt must be made to get the purest air possible, by opening a window of a neighbouring room or passage.

When a dressing-room opens out of the bedroom, its window may be used as the inlet, especially when the disease is bronchitis or other inflammatory chest trouble. The door between the two is left open, and thus the fresh air becomes diffused gradually through the sick chamber, and no draught can be felt.

When the air is quite still—as sometimes in summer—and there is "not a breath of air," the nurse may take a towel and wave it about the room for a few minutes: it will make the air feel fresher.

Hot air ascends, cold air falls: hence the air next the ceiling is the hottest. That next the floor is the coldest. After lights are lit the air of the upper part of a room soon becomes very warm: this is readily perceptible on mounting a step-ladder. The heated air in the chimney ascends, because it is lighter than the colder air outside: just as a cork pressed below the surface of water rapidly rises to the surface. Hence as the air breathed out is warmer than that taken into the body (and is impure), there ought to be an outlet for foul air near the ceiling, but practically we have to make use of the chimney-flue for this purpose.

The Outlet.—The chimney-flue is of the utmost importance for this purpose. Without an open fireplace a room cannot be well ventilated, unless there is an inlet at one end through which air really does enter, and the door is at the opposite end serving for the outlet. This rarely occurs. Practically, the sick room cannot be ventilated, and the patient cannot be supplied with the air he so much needs, without an open fireplace, or if it be blocked up.

If a fire is burning in the grate fresh air must enter the room, but if the volume going up the chimney exceeds that coming in at the window and door—there will every now and then be a rush of air *down* the chimney and a puff of smoke come into the room. The remedy, as already said, is to open the window or door a little wider. One must carefully distinguish between *warmth* and *stuffiness*. If you think the room too warm look at the thermometer. "Too warm" often means "*stuffy*," that is "impure," and means imperfect ventilation, and one must not attempt to cure this by letting the fire get low, but by admitting more fresh air.

Night Air is colder than that in the daytime. Many people have a dread of night air. The window need not be so far open as in the daytime, because as the air is colder, it enters more rapidly through a given aperture. The window at night should not be quite shut unless a very strong cold wind is blowing against it. As to purity of air, in most of our large manufacturing towns the air is purer at night than in the daytime. The coldest part of the night is from 2 to 4 o'clock a.m., and this is the very time that our vital powers are lowest ; when the body seems less able to resist morbid influences, and when many old people succumb to their disease. It is then that extra blankets should be at hand, and the patient given some warm drink A hot-water bottle may be required for the feet.

At sunset the air often gets suddenly cooler, and just as the dew is falling. This is a time when the window may be temporarily closed or nearly so, and opened wider after the dew has fallen.

Reason for Ventilation.—Ventilation is needed (1) in order to remove from the room certain waste products given off by the human body. These waste products are extremely poisonous.

The chief poison is a gas called carbon dioxide or carbonic acid gas, and it is given off from the lungs and comes away with expired air. It consists of a mixture of carbon and oxygen, and is represented briefly by chemists by the formula CO_2, which means that it consists of two parts of oxygen for every part of carbon. It is produced also when things containing carbon are burnt in air, the carbon uniting with the oxygen contained in the atmosphere. About 20 per cent. of the atmosphere consists of oxygen gas. Coal gas, candle and oil burnt in air produce a large quantity of carbon dioxide, so that ventilation has to provide not only for the removal of this gas produced by living beings, but also for that produced by the other things just named.

It is this gas that causes the feeling of oppression and headache when one stays long in a close room. The foul odour is due to *organic* matter, little bits of the body that come away with the breath and from the skin, and rapidly decompose, producing foul-smelling gases. (2) Ventilation has also to furnish a fresh and continuous supply of pure air fit for respiration. The gas actually needed for this purpose is the oxygen already named.

It is worth while for the pupil to perform a very simple experiment. Get some powdered chalk or bicarbonate of soda (a teaspoonful), place it inside a pickle jar. Pour on it a teaspoonful of strong vinegar (diluted nitric acid or hydrochloric acid do better). There will be produced a vigorous effervescence. When this has nearly ceased dip a *lighted* match or taper into the bottle, and the light will be immediately extinguished. This is because the jar is filled with a gas which will not allow anything to burn in it, *i.e.*, it will not "support combustion." This gas is carbon dioxide. *Nothing* can live in it. Hence the necessity of getting it out of our living rooms as completely as possible.

FEVER

Fever means an elevation of the temperature of the body above what is called the "normal temperature," or that of health. The normal temperature of the body, when taken in the axilla, or armpit, is 98·6°. The temperature of internal parts, such as the mouth, is about one degree higher.

A temperature *below* the normal is called "subnormal."

It may be taken in the armpit, the fold of the groin, or the mouth. In the two former situations the skin should first be dried, and the thermometer left in for about five minutes. When placed in the mouth the lips must be kept closed all the time.

The temperature should not be taken within half an hour of a warm or cold bath; nor in the mouth soon after drinking anything hot or cold.

Now compare a "wall" and a "clinical" thermometer a little more closely, and it will be observed that as the temperature falls, the upper limit of the mercury in a wall thermometer falls with it. But a clinical thermometer continues to indicate the *highest* temperature reached, and it will be seen that it does this by means of a separate small column of mercury on the top of the rest. This small portion is called the "index," and does not go down unless it is shaken down forcibly. It is necessary immediately before taking a patient's temperature to see that the index is shaken down below the normal point. A patient, then, is feverish if his temperature exceeds 98·6°, but this does not imply necessarily that his disease is "a fever," properly so called. By a fever is meant a disease running a definite course and communicable from person to person or—in common language—infectious or "catching." An infectious disease is caught in many ways: by coming into active contact with a patient suffering from it; by breathing the infected air of the sick room or house; by using the same drinking vessels; by drinking milk or water that has become contaminated with discharge from the patient; and by handling clothing that has not been disinfected after use in the sick room. One attack of a fever generally protects the person, more or less, against another attack of the same disease.

But, though a patient is not suffering from a particular fever, yet if his temperature is above the normal he is suffering from "fever."

A child when teething is often found suffering from fever or feverishness, which may come and go several times a day. An inflammation, such as quinsy, abscess, an inflamed joint, produces fever, but is not "a fever."

The temperature of a patient suffering from a fever, such as typhoid, is now and then found below the normal, so that at those times one might say "there was no fever."

There are infectious diseases which are not fevers: such as ringworm and itch.

We will now consider fevers strictly so called. Those best known in this country are scarlet fever, measles, smallpox, chickenpox, typhus, typhoid, diphtheria, whooping-cough, mumps, and pneumonia.

It will be well to study one fever throughout its whole course, from the commencement to the termination, and to learn its various "stages," for by so doing it will be easy to understand the special characteristics of the various fevers one meets with. For such a purpose *Measles* furnishes an excellent model.

Measles.—The first sign of measles is *cough*, dry, hacking and frequent. The *eyes* look watery and reddish, and there is running at the nose, with sneezing.

There may be *sickness*, in young children sometimes *convulsions*.

The cough is often mistaken for croup. No phlegm is brought up with it. Take the patient's *temperature*, and though he may complain of feeling cold and shivery, it will be found two or three degrees above normal, say perhaps 101°. There is *headache*.

The *pulse* is quicker than normal. The *skin* is dry, the *tongue* foul. *Appetite* is lost. There is *thirst*.

The patient continues practically in the same state for four days, and then on the fifth day another and very special sign appears, namely, a rash on the skin. The coming out of the rash marks the beginning of another stage.

From the beginning of fever to the appearance of the rash —four days—is called the "stage of outset," or invasion.

The appearance of the rash—which is also called *eruption*—marks the beginning of the "eruptive stage." At the beginning of this stage sometimes, but more frequently during an early part of the stage of outset, the patient has a severe shiver. This shivering fit is termed a "*rigor*." It is to be specially noted that at this moment the patient is hotter than natural, *i.e.*, his *temperature* is raised although he feels cold. This rigor can be recognised easily enough in older children and adults who can say what they feel. In young children it is often mistaken for a convulsion. It lasts a few minutes, or may come on at intervals for an hour or two. The pulse gets quicker, perhaps 120 to 140 in a child where its usual rate is 100.

The rash is a reddish purple, and first is seen on the sides of the neck and face, though if sought for, it may be detected still earlier, in many cases, on the back. It occurs in irregular shaped patches about the size of a split pea.

The cough, loss of appetite, and thirst, still continue.

This stage lasts six days, by which time the rash has faded, and, in a favourable case, the temperature falls again to normal.

Complications are diseases — generally inflammations — of various organs that occur sometimes in the course of a fever, but are not an essential feature of the fever itself. It is during this eruptive stage that complications are apt to make their appearance.

The commonest complication in measles is inflammation of the lungs, and this is what causes death in most instances where measles proves fatal.

The next stage is that of "*Decline*" or "*Defervescence*." The cough and other symptoms disappear, the appetite returns and the normal functions of the body begin to be again performed. The special feature of this stage is the commencement of *Desquamation* or peeling of the skin. The surface comes away in the form of scales like fine bran. If the temperature has not already become normal it soon does so.

This stage lasts a few days and is followed by that of

Convalescence: during which the patient is gradually restored to health.

Do those four stages constitute the whole course of the disease? No. Fevers are due to the entrance into and multiplication within the body, of living germs, extremely minute specks that increase with enormous rapidity, and in their growth produce substances that act as poison to the various tissues of the body and the blood.

When measles germs enter, they manifest no discoverable sign of their presence until after ten days, when the stage of invasion shows itself. These ten days constitute the stage of *incubation*, which means hatching.

The growth and multiplication of germs within the body bears some resemblance to the process of fermentation, as occurring in dough (flour, water and salt) when yeast is added to it. Yeast consists essentially of living germs. It produces carbon dioxide and alcohol in the dough, two poisonous substances which correspond to the poisonous substances produced by disease germs in the human body.

When a child contracts measles from another child which it has come into contact with, say on the first of the month, for ten days there will be no sign of anything wrong, but on the tenth day it will feel chilly and commence to cough. Four days later the rash will appear. The rash in measles, therefore, comes out fourteen days after the child has got the infection.

The most infectious period is the two days *preceding* the appearance of the rash.

Thus we find in measles five distinct stages.

1st. Incubation.
2nd. Onset or invasion.
3rd. Eruption.
4th. Decline.
5th. Convalescence.

Similarly five stages can be detected or recognised in all fevers that have a characteristic rash. What these special features are will be seen when each fever is considered separately.

We must now consider—

(1) How measles is spread.
(2) *Treatment* of a case.

This is divided into three parts—

Quarantine or isolation.
Hygienic treatment, including diet, and
Disinfection.

The germs of measles are believed to be specially abundant in the discharge from the nostrils and air passages. They may therefore easily become diffused throughout the air of a room, and by being inhaled by another individual may thus spread the disease.

Quarantine means the separation of the patient as far as possible from others who have not already suffered from the same disease.

As soon as a child is suspected of showing signs of measles, it should be kept away from other children, and such isolation should last until after the rash has faded.

Treatment.—The child must be kept in bed, in a room the temperature of which is a little over 60°. It must be protected from cold draughts, but the room must be well ventilated.

The diet is to consist chiefly of milk, water, barley-water. When the child asks for a change, give bread, gelatine (calf's-foot jelly) and meat broth. The white of egg beaten up in

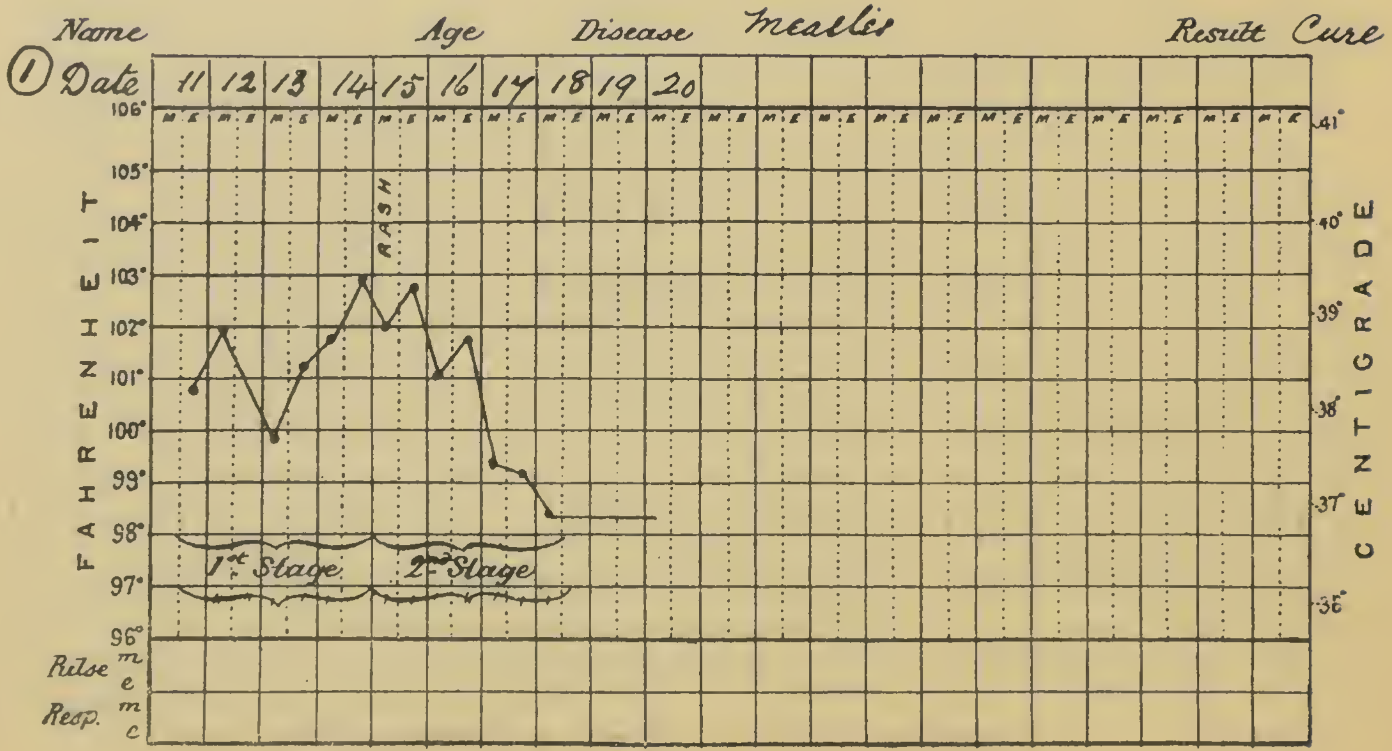
Name
Age
Disease
Measles
Result
Cure
① Date
11
12
13
14
15
16
17
18
19
20
M E
106°
105°
104°
103°
102°
101°
100°
99°
98°
97°
96°
FAHRENHEIT
41°
40°
39°
38°
37°
36°
CENTIGRADE
RASH
1st Stage
2nd Stage
Pulse m e
Resp. m e

Fig. 6.

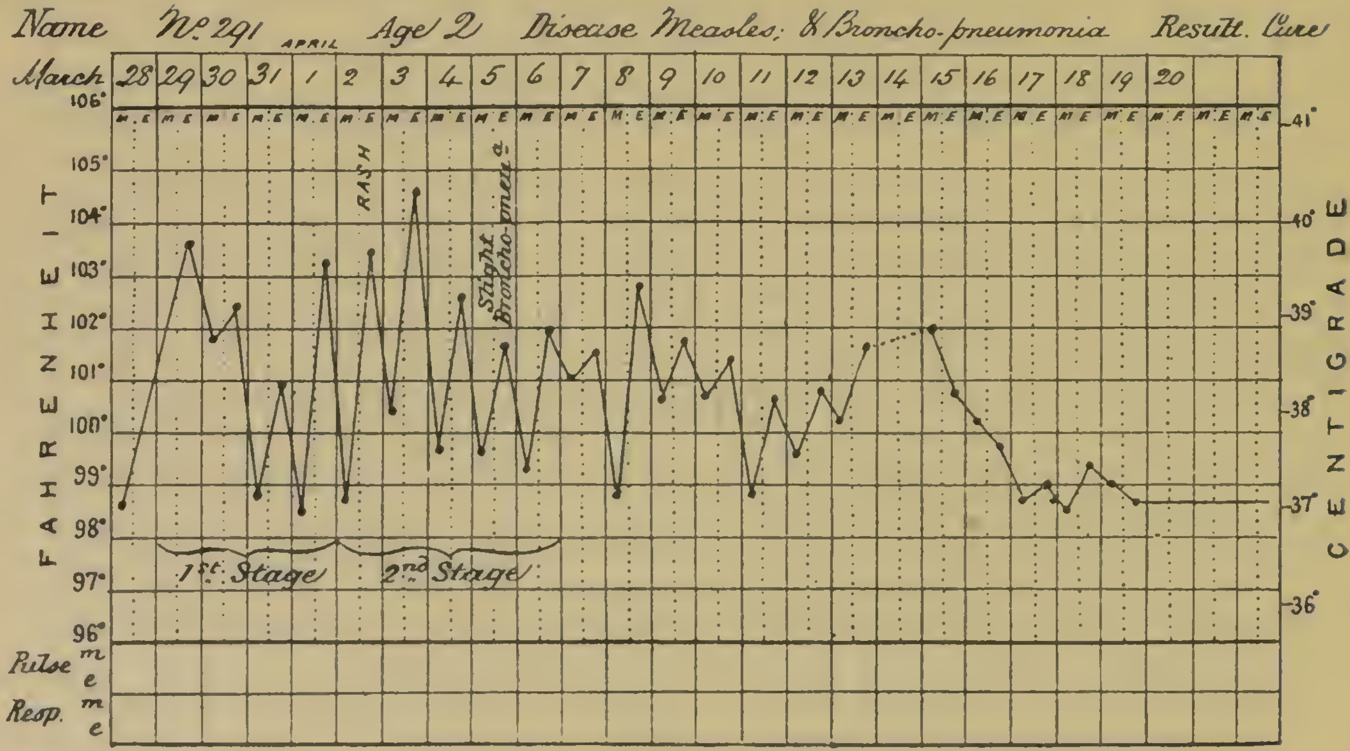
Name No. 291
Age 2
Disease Measles; & Broncho-pneumonia
Result. Cure
March
28
29
30
31
April
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
M. E
106°
105°
104°
103°
102°
101°
100°
99°
98°
97°
96°
FAHRENHEIT
41°
40°
39°
38°
37°
36°
CENTIGRADE
RASH
Slight Broncho-pneu.a
1st. Stage
2nd. Stage
Pulse m e
Resp. m e

Fig. 7.

a pint of water and flavoured with lemon juice makes a suitable drink.

Washing: the skin of the whole body must be washed with warm water night and morning.

Disinfection will be considered later on. It treats of the means that are employed to destroy the germs of the disease clinging to the patient's body or clothing, or lodging in the room or floating in the air.

Crisis means rapid improvement. This occurs generally in measles, also in scarlet fever, typhus, pneumonia, etc. When the temperature falls slowly and only reaches the normal after several days or perhaps weeks, the "change for the better" is not termed crisis but *lysis*. There is no "crisis" in most cases of measles that are complicated by inflammation of the lungs.

The two charts showing the course of temperature in two cases of measles should be studied (Figs. 6 and 7). Note that in the second case the temperature did not rise above normal after the first time it fell to this point in the *evening*. It had on several *mornings* been normal, but rose later in the day.

The first case illustrates what is meant by crisis; the second by lysis.

Sequelæ or "dregs."—Measles may be followed by deafness, abscess in the ear, whooping-cough, bronchitis, consumption.

Epidemic.—When a large number of cases occur in a town or country at and about the same time, the disease is said to be epidemic. Sometimes one meets with a single case without any others occurring; it is then said to be *sporadic*. If a disease is permanently present in a country—such as cholera in certain Eastern countries—it is said to be *endemic*. Malaria (or ague) is endemic in marshy districts.

Measles is not endemic in any country.

Protection or Immunity.—One attack of a fever causes some change in the body which thus renders it less subject to the disease in future. This protective effect is called "immunity." The degree of immunity varies in different fevers; with some it is very slight or transient, as in influenza; it is well-marked in scarlet fever, measles and small-pox.

ERUPTIVE AND CONTINUED FEVERS

A RASH or eruption on the skin is a prominent sign of some fevers, and the condition of the patient gets worse at the time the eruption appears. This is true of measles, scarlet fever and small-pox. These are called "eruptive" fevers.

There are others which are accompanied with more or less of rash, or there may be no rash at all, but when there is a rash, the patient's condition shows no appreciable change simultaneously with its appearance. These fevers are called "continued." As a rule, the symptoms are slight at first—perhaps for several days—and the whole course of the fever may be prolonged for several weeks.

Typhoid is the commonest continued fever.

There are other diseases which are in reality fevers, but which cannot be included in either of the above classes, such as pneumonia, mumps, whooping-cough and diphtheria.

Scarlet Fever—or Scarlatina.

Incubation.—A few hours to five days.

Onset.—Sudden, with rigor, high temperature, and vomiting.

Eruption on second day. The rash is scarlet, distributed over whole body, and well marked on the face. It is in the form of small spots. The amount of rash is often in proportion to the severity of the disease.

The tongue looks like a strawberry or raspberry in colour and surface.

Temperature 103° or higher (Fig. 8).

Delirium often occurs.

The glands just below the edge of the jaw become enlarged. Abscess may form.

The throat is sore in most cases; sometimes ulcerated, showing yellow patches or holes on the surface of the tonsils.

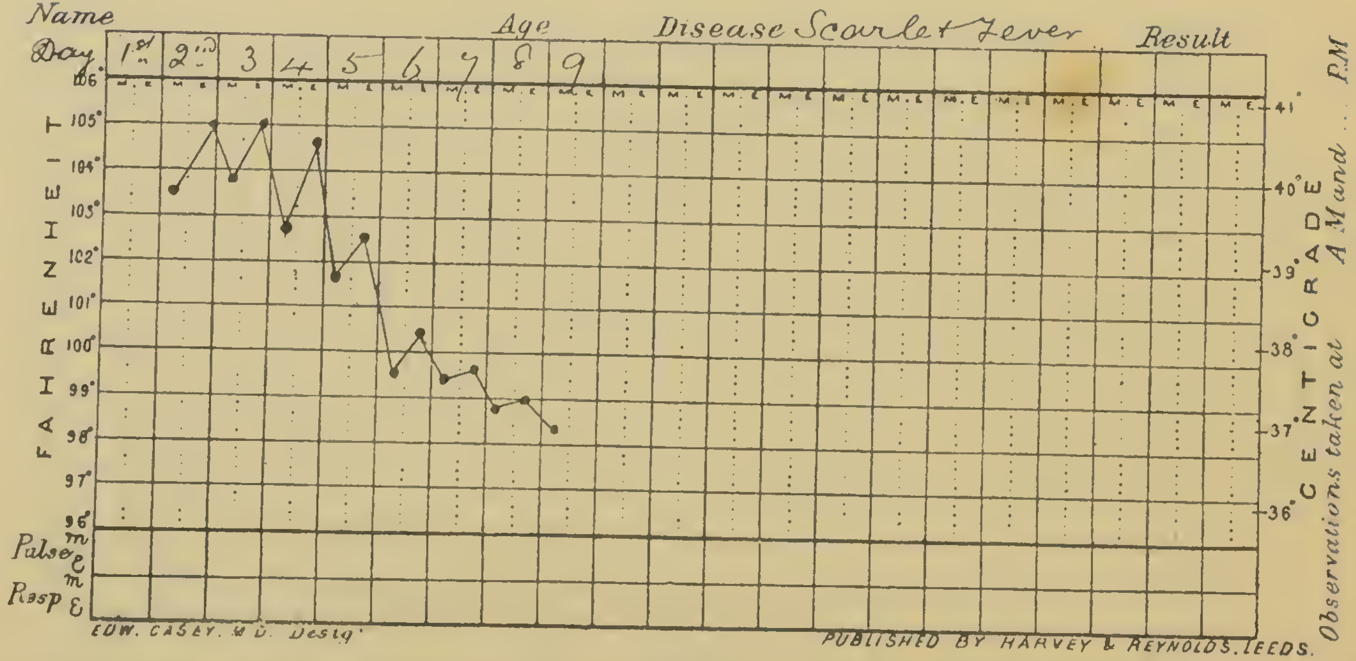
Name
Age
Disease Scarlet Fever
Result
Day 1st 2nd 3 4 5 6 7 8 9
M. E.
FAHRENHEIT
106° 105° 104° 103° 102° 101° 100° 99° 98° 97° 96°
CENTIGRADE
41° 40° 39° 38° 37° 36°
Pulse m e
Resp m e
Observations taken at A.M and ... P.M
EDW. CASEY. M.D. Desig.
PUBLISHED BY HARVEY & REYNOLDS. LEEDS.

FIG. 8.

The chief *distinguishing* features are fever, scarlet rash and sore throat.

Desquamation is in the form of distinct, sometimes large flakes: well marked about the fingers. It begins as the rash fades, and may not be complete for three or four weeks.

Infection.—It is spread by the scales from the skin and discharge from the nostrils or throat.

Quarantine must last even in mild cases for six weeks.

Sequelæ :—

Dropsy, due to inflammation of the kidneys is a not uncommon result. The first sign is a puffiness of the eyelids.

Abscess of the neck.

Inflammation or abscess in the ear.

Treatment.—The same as for measles.

As soon as desquamation begins, rub olive oil, carbolic or camphorated oil into the skin each day to prevent the scales flying about the room.

If the nostrils are discharging, they should be syringed with a solution of glycerine and borax (a teaspoonful of each to a tumblerful of warm water).

A small ball-syringe, made all of rubber, that can be worked entirely by one hand should be used. The child's head should be held face downwards over a large wash-basin.

Care must be taken to guard the patient against a chill.

Small-pox.

Incubation.—Fourteen days.

Onset.—Sudden. Headache, vomiting, pain in the back, rigor, high temperature.

Eruption on third day. At first small papules—little lumps—of a red colour appear, especially on the face and hands. They feel very hard—like shot below the skin—those of chicken-pox, which at first look similar, are soft. The papule soon becomes a *vesicle,* that is, filled with fluid, and this fluid soon, by the eighth day, becomes a *pustule*, that is, filled with yellow matter, called "pus." As the pustules develop, the temperature goes still higher.

The more numerous the pustules, the more severe is the fever; sometimes they run together so that an almost continuous mass of scabs covers the whole body. It is then called "confluent small-pox." Violent delirium may set in, and in such a case the patient must not be left alone for a moment. The window must be secured and all cutting instruments removed.

Loss of sight may result from pustules on the eye.

Defervescence is slow.

Quarantine must last till some time after the rash has disappeared.

Infection comes from the breath and skin.

Treatment is the same as for fevers in general. Also as soon as a case of small-pox has been recognised as such, all inmates of the house must be vaccinated, and those that have been done in infancy should be re-vaccinated.

Vaccination is a modified and very mild form of small-pox, and affords almost as complete protection against it as an attack of small-pox itself affords.

The efficacy of vaccination was proved by Edward Jenner in 1796.

Chicken-pox.—The first thing actually observed in most cases is the eruption—in the form of little red pimples or papules over the whole body. They come out in successive crops for a few days and soon becomes vesicles (filled with a watery fluid), and then dry up. They feel soft.

The temperature seldom goes higher than 102°.

The spots leave marks or "pits" on the skin.

German Measles closely resembles measles, but is a much milder disease. It seldom keeps the child in bed.

The throat may be sore, but there is little or no cold in the head, with running of the nose, and no cough. It is not followed by serious sequelæ.

In a doubtful case, treat it as for measles.

CONTINUED FEVERS

Typhoid Fever, also called "gastric," and "enteric" fever.

This should receive the student's very special attention, because it is one of the most dangerous and tedious which she may be called upon to attend, and there are so many details involved in nursing a case of typhoid, that it is almost a complete education in itself, and a nurse who is equal to all the emergencies that may occur, will be competent to undertake the care of any other case of sickness.

Incubation.—About fourteen days, but varies much.

Onset.—Slow and treacherous. For many days the patient feels out of sorts, without anything definite to indicate what is the cause. He feels chilly, and is disinclined to exert himself or to take food.

The temperature, if recorded from the first day when it begins to rise, will be found to run a course which is characteristic. Suppose one night it is found 2° above normal, next morning it will be 1° above normal, the succeeding night 3°, next morning 2°, and at night 4°. It falls on each morning, and is always higher at night. It rises at night above the morning level throughout the whole course of the disease, but for weeks runs a very irregular course.

Prostration sets in early; the patient lying flat on his back in a listless condition. He seems stupid and is slightly deaf.

Delirium comes on during the second week and lasts as long as there is fever.

The tongue becomes quite dry and brown, covered with a dirty-looking deposit, found also on the teeth.

The abdomen swells, and gurgles when pressed with the hand.

Diarrhœa is almost always present, and the motions are extremely offensive, and are often passed involuntarily.

Sometimes during the second week a few rose-coloured spots may be found on the abdomen—this is the eruption of typhoid, and is not present in every case. The characteristic features of typhoid then are—long-continued fever, dry brown tongue, swollen abdomen, prostration and diarrhœa.

The typhoid germs attack specially the small intestine, causing large sores—*ulcers*—to form on its internal surface, *i.e.*, the surface with which food comes into contact. These ulcers may get deeper and deeper, and finally eat right through the whole thickness of the bowel. This is called *Perforation*, and is usually followed by death. A large blood-vessel may be opened into and cause serious hæmorrhage. Either event is accompanied by a distinct change for the worse in the patient's condition, coming on suddenly. The face becomes pale and pinched looking, and the pulse almost, or quite imperceptible.

Other Complications are—Inflammation of the lung; heart failure. The heart is weak in every case of typhoid, and the nurse must guard against fainting. The patient must not be allowed to raise his head from the pillow.

Defervescence is very gradual.

Convalescence rarely begins earlier than the end of the sixth week, and is protracted.

Relapse.—Sometimes after the patient seems in a fair way to recovery, all the disease symptoms reappear in their former severity. This is called a relapse, and is a not uncommon occurrence in typhoid.

Infection.—The germs exist in countless numbers in the excretions from the bowel and kidneys. Long after they have disappeared from the motions they may still be present in the urine.

Some minute portion of the excretions may gain access to the drinking water, especially if got from a well. Milk is often contaminated. These (water and milk) are the two chief sources. The milk may be pure on reaching the house or it may be polluted at the farm.

On the first appearance of a case of this fever, the water and milk supply should be inquired into immediately. Any unsanitary defect about the house must be remedied, and the inmates should drink no water or milk that has not been *boiled* shortly beforehand.

Typhoid has also been traced to oysters from oyster-beds near the mouth of a river polluted with typhoid excretion.

The eating of uncooked vegetables grown on land to which sewage has access has caused typhoid.

Quarantine.—Such strict quarantine as is necessary in scarlet fever and small-pox, etc., is not needed. The disease is not conveyed through the breath, but merely through excreta, and these must be thoroughly disinfected before leaving the room.

Treatment.—The general and dietetic treatment is similar to that of the fevers already named.

Solid food must not be given too early for fear of irritating the ulcers. Five ounces of milk every two hours is the right amount for an adult.

Alcoholic stimulants are needed in many cases.

The patient must be kept on his back unless the doctor orders otherwise.

The mouth must be cleaned at frequent intervals, say every four hours, by means of a piece of old linen wrapped round the finger, and then dipped in a solution of borax and glycerine (a teaspoonful of each to the tumblerful of warm water).

The whole body must be washed night and morning with warm water, care being taken not to expose more than the actual part being washed, and special attention must be given to the back, which ought to be rubbed night and morning with a little brandy and water, or brandy and glycerine (equal parts of each) to prevent bed-sores. The part must be *rubbed*, not bathed, therefore a flannel must be used and not a sponge.

He must be thoroughly cleaned after each action of the bowels. If the bed-clothes have been even slightly soiled by excreta, on drying, germ-containing dust may find its way into the atmosphere and be inhaled by the attendants. A draw-sheet and protector *must* be used.

Nurses and doctors have caught the disease from neglecting to wash the hands, which should be done *every* time the patient or bedding has been touched.

The hands of the nurse should be washed and then soaked in disinfecting solution just before taking her meals.

The patient should have everything done for him as far as possible, and should be moved (as when his back is to be washed) without being allowed to make any effort himself. His temperature, pulse, and respiration should be taken every four hours. If the temperature goes very high, sponging the skin must be done frequently, and he must have very few and light bed-clothes.

A mackintosh and draw-sheet must be under the patient all the time.

A basin of disinfectant should be at hand for the doctor, and a separate one for the nurse.

A feeding cup is required.

Typhus is, owing to improved sanitary conditions, seldom seen now in England, and is confined to an occasional sporadic case in the overcrowded district of some large town. It is associated with filth, overcrowding and destitution.

It is highly infectious.

Incubation lasts ten days.

Invasion is sudden, with headache, high fever, delirium and stupor.

Eruption appears in from four to six days. It is a mulberry-coloured rash, something like measles, but confined (as a rule) to the chest.

Complications.—Inflammation of the lung and meningitis may occur.

Defervescence by crisis.

Quarantine until convalescence.

Treatment.—As for fever in general, but with particular attention to free ventilation.

The nurse must avoid the patient's breath, as this conveys the disease.

Other Feverish Diseases.—In addition to the foregoing, there are several diseases that are not usually spoken of as "fevers," but which are now known to be produced, each by a specific germ: they are also not accompanied by a rash. Their special feature is the presence of some one condition which is so prominent as to overshadow all other signs and symptoms, and is the one condition demanding particular care and treatment.

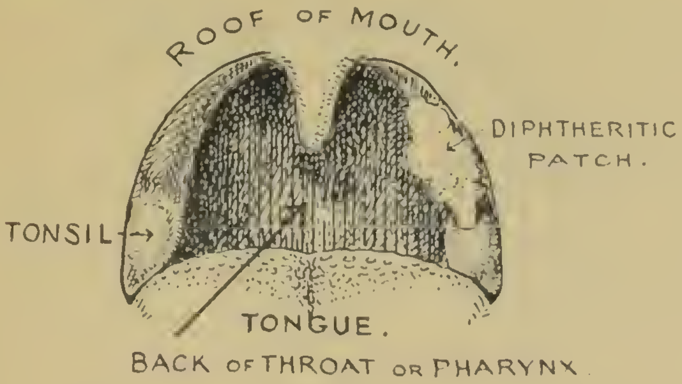

Fig. 9.

The diseases referred to are:—

Diphtheria, whooping-cough, mumps, pneumonia and consumption: they are all germ diseases, and they are all infectious, though pneumonia is very slightly so.

Diphtheria begins gradually. It is a disease specially apt to attack the young.

The temperature is *generally* only slightly raised, perhaps 2° or even less.

The germs attack first the pharynx, that part of the throat near and behind the tonsils, producing a deposit looking like wet wash-leather. It is seen in most cases on the tonsil first (Fig. 9). It gradually extends at its edge until it may cover a good part of the throat and soft palate. A *large* patch may have already formed by the time it is first detected. It can be peeled off the underlying tissue, and is sometimes coughed up in big pieces.

If it grows downwards to the windpipe it causes obstruction, and the patient may suffocate unless relieved by tracheotomy.

Prostration is great, and there is a marked tendency to fainting. Frequently a patient has suddenly died (from syncope) through being allowed to sit up too soon.

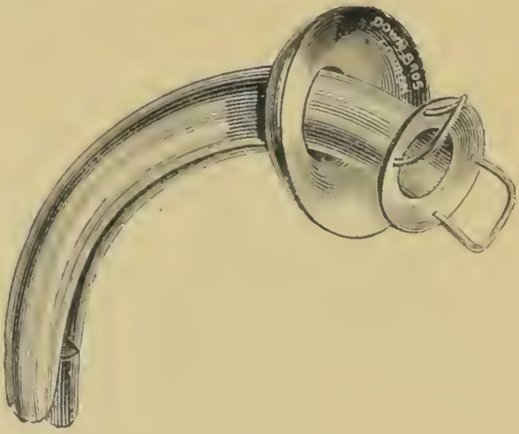

FIG. 10.

The nurse must avoid the child's breath and not let it cough into her face. If the latter happens, she must at once wash her face and gargle her mouth with a disinfectant (such as Sanitas). The nostrils also should be syringed.

Quarantine must be strict. Visitors, without catching the disease themselves, may convey the disease to others, through dust of the room adhering to their clothing.

Sequelæ.—Paralysis of the eye muscles (producing squint), of the palate (rendering swallowing difficult), and of the legs may result, but recovery usually occurs after a few weeks.

Treatment —Antitoxin is now used by medical men ; it is injected under the skin in the form of a liquid.

If the nurse has to paint inside the throat, she should cover her mouth and nostrils with a handkerchief soaked in perchloride of mercury solution whilst doing so.

Tracheotomy is opening the windpipe by a cutting operation. A tube (Fig. 10) is inserted in the opening and left in position and the child breathes through this tube.

The nurse's duty is to see that the tube is maintained in position and is kept clear of mucus.

The room should be kept warm and moist: the proper temperature is about 73° to 75°. A bronchitis kettle is employed to give the necessary amount of moisture.

Whooping-cough is highly infectious, and most children suffer from it.

The first sign is cough, and very early it occurs in paroxysms or "fits," being sudden, energetic and lasting five to ten seconds, or longer. It is worse at night; the child awakes frightened and has to sit up in bed. The whoop (or "kink" as they call it in the North) is heard within a fortnight of the commencement. It is a high-pitched note, occurring as the child is drawing in the breath. During the whoop the child remains still, with its arms and body rigid. At the end some gelatinous phlegm is brought up, and immediately afterwards the little patient runs about again as if nothing had happened.

The whoop continues six weeks or longer. In winter it may last many months, but the infectious stage is probably past by the end of the sixth week.

After the child has apparently quite recovered, a slight cold will again bring on the whoop, but the disease is not infectious during these relapses.

Complications.—Inflammation of the lung (broncho-pneumonia) is the most frequent.

Treatment.—In fine mild weather the child should spend a good deal of time in the fresh air, but it must be protected against chills.

The diet must be plain, and milk is the best food.

Mumps is characterised by the sudden appearance of a painful swelling of the parotid gland at the angle of the jaw and below the ear. Both sides are usually swollen. The parotid gland secretes saliva (the fluid poured out into the mouth during eating).

Mumps is very infectious, and is probably conveyed by the breath.

Pneumonia has only recently been classed amongst infectious diseases. Its contagiousness is only slight when compared with such a disease as scarlet fever. The essential and conspicuous feature is inflammation of one or both lungs. It often follows exposure to cold, and hence has been regarded as an ordinary inflammation of the lung, but such is not the case.

It is caused by a special germ, which is so widely distributed that some say it is present constantly in the nostrils of healthy people, *lurking* there as it were, ready to make its onset on the lung whenever a favourable opportunity offers itself.

The *Onset* is sudden and begins with a rigor or "shivering fit," which is generally severe and lasts half an hour. This is characteristic. The temperature, during the rigor, is several degrees above normal.

Other symptoms of fever soon show themselves: headache, nausea, loss of appetite, thirst, furred tongue and rapid pulse.

Note the *Respiration*: it is quicker than normal. An adult in health breathes eighteen times per minute, a child rather quicker. In pneumonia the rate is increased, the rate depending upon the amount of fever, but chiefly upon the extent of the lung involved in the inflammation. It may be as fast as 35, 40, or even more.

Compare the pulse rate with the breathing.

In health the pulse is 72 per minute, that is four beats of pulse to each respiration. In pneumonia this ratio is disturbed—for though the pulse is quickened, it is not quickened to the same proportion that the respiration is. So that, if the respirations amount to 50 per minute, the pulse will probably not be more than 130—that is less than 3 to 1 instead of 4 to 1 as in health. This is a very important point to observe.

Cough is generally troublesome. The phlegm is very sticky and difficult to get up. It has a characteristic appearance, looking "*rusty.*"

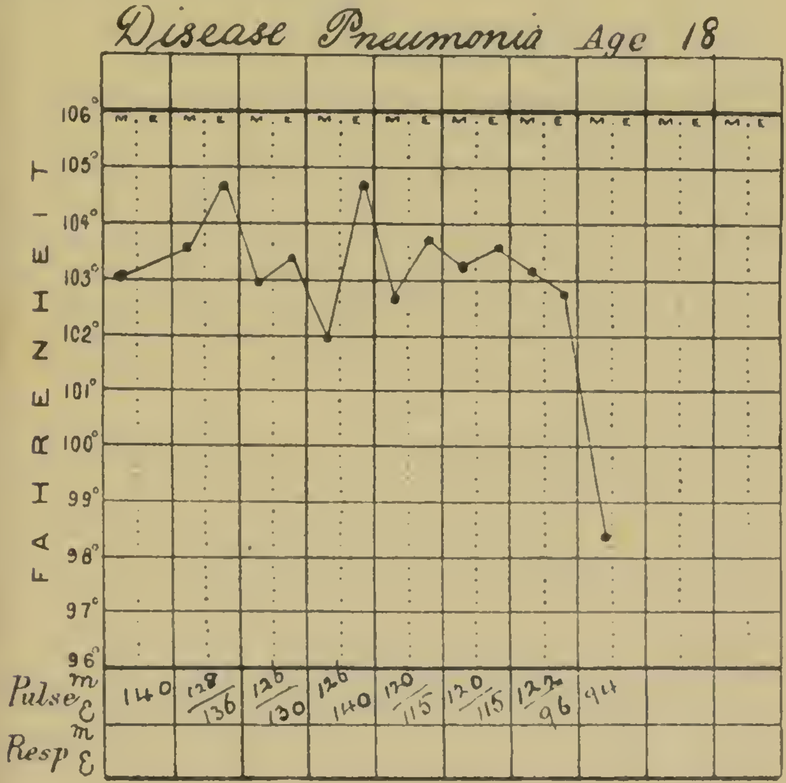

FIG. 11.

Defervescence is by crisis and occurs on the eighth day, the temperature (in favourable cases) falling to normal in a few hours or less.

Pneumonia is very likely to terminate fatally in those of intemperate habits; and it not uncommonly ends in "consumption" in those who have inherited a tendency to tuberculosis (consumption).

Treatment.—The general hygienic and dietetic treatment is the same as for fevers.

Influenza has of recent years become endemic (see p. 22) in England, and is often epidemic. One attack confers only slight immunity.

Onset.—Generally sudden with pain in the head, back and limbs, fever and prostration. It varies much in different epidemics as to other symptoms.

The chief complication is some disease of the respiratory organs, such as bronchitis or pneumonia.

Treatment.—The patient should remain in bed even in the mildest case, and must guard against "cold" on first going out.

In young children there is sometimes persistent vomiting, even a teaspoonful of iced water being at once rejected. In such cases sherry whey, given in teaspoonful doses, is extremely useful.

Sherry whey is made as follows:

To a pint of *boiling* milk; add two wineglassfuls of sherry wine; strain through muslin to remove the curd which forms; the whey is the liquid that passes through the muslin.

Phthisis, Consumption, or Tuberculosis.—Tuberculosis has been much studied of late. It is the commonest of all diseases, at least it causes more deaths. Thousands of lives would be saved every year if better hygienic conditions existed in and about our homes and workshops, and if greater care were taken as regards food, clothing, and out-door exercise. It is a germ disease—the germ, known as the *Tubercle Bacillus*, was discovered in 1880, by Professor Koch of Berlin. It is this bacillus which spreads the disease. It may attack almost any part of the body, the favourite sites being the lungs, glands (in the neck and abdomen), and joints (as in hip-joint disease). When the lungs are affected the disease is known as "phthisis" or "consumption."

The chief point I wish to impress upon the reader is that in consumption the germs are present in the expectoration or "sputum," the stuff coughed up from the lungs, and that this sputum is the real source of danger to other people.

What is to be done with the sputum?

First, for the patient's own protection, he must be told not to swallow it, as this would convey the germs to the intestine, which might thereby become infected.

Secondly. The sputum should be expectorated into some vessel containing carbolic acid, or other powerful disinfectant. He may use a special cup or bottle fitted with a lid, this being emptied and disinfected at intervals. A small jar containing some sawdust saturated with carbolic may be used.

All sputum must be burnt before it is allowed to dry. So long as it is moist it will not be floated into the air, but once having dried, it may easily pass as dust into the atmosphere and be inhaled by other people.

Handkerchiefs should not be used, but instead, small pieces of rag, and these must be burnt or put into disinfectant *immediately*. The patient must not spit on the floor of any room or conveyance.

The disease may be caught by kissing a phthisical patient, or by the sputum coming into contact with a scratch on any part of the skin. Hence the importance of extreme cleanliness, and the occasional employment of disinfectants by those in attendance upon consumptive patients.

Treatment.—The patient must have—

1. Warm woollen clothing.
2. Abundance of nourishing and easily digested food.
3. Continuous supply of fresh air. No other means can avail if the patient neglects this point. In fine weather he should live outside as much as possible. If confined to the bedroom, the window must be open all the time, and as wide as it can be borne.

Consider now a few features of fever in further detail.

The Germs that cause fevers are extremely small; they float in the air, and adhere to clothing as well as to the patient's body. They possess considerable vitality; the diphtheria germ, for instance, has been proved to be alive and active twelve months after quitting the patient's body. It is for this reason that it is necessary to employ some artificial means of killing them, and for this purpose disinfectants are used.

Source of Infection.—In endeavouring to trace the source of infection in any given case, one should inquire into the following points,—

(*a*) The occurrence of the disease in any friend, visitor, or child attending the same school.
(*b*) Purchase of second-hand clothing or furniture, within the previous three weeks.
(*c*) Who does the washing, and where.
(*d*) The water supply (wells).
(*e*) Is the W.C. properly trapped and ventilated.
(*f*) Is any sink or waste-pipe connected directly with the sewer.
(*g*) Has a drain been blocked, or unpleasant smell noticed.

The *Temperature* varies. It is high in scarlet fever and small-pox, higher at night than in the morning in typhoid; higher in small-pox than chicken-pox. May be only slightly elevated in diphtheria.

If it goes to 106° or beyond, there is danger from this cause alone.

Prostration.—If this is great, the patient *must* have stimulants. Alcohol here finds its chief use.

Diarrhœa.—If profuse, it is sometimes well to withhold milk entirely for twenty-four or forty-eight hours, giving chicken-broth, mutton-broth, barley-water and gelatine.

The *Rash.*—Flea-bites are sometimes mistaken for a fever rash. A flea-bite is a small reddish circular patch with a *dark* spot in the centre.

Washing the Patient.—There is a strong objection amongst the poor and working-class population to washing fever patients. Washing removes impurities from the skin and keeps the pores open. If the pores become blocked the function of the skin, as an excretory organ, is interfered with.

Washing is a means of removing from the surface and destroying the very germs that cause the disease, especially in scarlet fever.

It helps to keep down the temperature. *How* a patient is to be washed will be described later.

Wasting.—This is always very marked in any lingering case of fever, especially typhoid. The diet must be of such a nature that this loss is regained as soon as possible, and must include a liberal allowance of flesh-forming foods (see *Food in Health and Disease* in this series).

The rule for the meals is "little and often," and the patient's taste must be consulted to a considerable extent.

DISINFECTION

THIS means the killing of disease-producing germs by so-called "disinfectants."

The various chemical substances termed disinfectants are also called "antiseptics," but all antiseptics are not disinfectants. An example will make plain the distinction.

Cold (freezing) acts as an antiseptic: it *arrests the growth* of germs, as in the frozen meats that come to this country from New Zealand and elsewhere, but the germs are not killed, and as soon as the temperature becomes sufficiently raised, they again become active.

Great heat, on the other hand, is a disinfectant, the most powerful of all disinfectants; it burns and kills the germs so that there is no possibility of their setting up further mischief.

"*Germicide*" is another name for disinfectant: it means, germ-killer.

A *deodoriser* or *deodorant* is anything, such as scent or incense, that destroys or disguises an offensive odour. It must not be regarded as a disinfectant.

The chief disinfectants are:—

Carbolic Acid or Phenol.—This is a white crystalline substance in the pure form, but liquid "commercial carbolic acid" is cheaper and equally good for disinfectant purposes. It is a powerful poison. It should be diluted with forty times its bulk of water, and this solution is spoken of as 1 to 40 carbolic solution.

Uses.—(1.) To disinfect clothing (in a tub).
(2.) To saturate sheet hung outside door of room.
(3.) For excreta.
(4.) For the hands.

Carbolic powder may be sprinkled about a room, on the boards, or placed in saucers.

Corrosive Sublimate (or perchloride of mercury) is a very powerful germicide. It is a deadly poison. It should be used in the form of tabloids, one of which is sufficient for a pint of water, making a solution of 1 to 2000, and which being bright red cannot well be taken in mistake for water.

Keep it in glass or earthenware; it acts chemically on metals.

Uses.—For the hands and clothing.

Permanganate of Potash (crystals).—This is used for making Condy's Fluid. It is dark red and stains clothing. It should be mixed with sufficient water to produce a claret-coloured solution.

When it has become brown from exposure to the air it is of no further use.

Uses.—For excreta, the hands and drains. It only acts on the substances with which it comes into actual contact, so that when placed in saucers about a room it cannot possibly disinfect the air of the whole apartment.

Sanitas is a pleasant liquid disinfectant.

Uses.—For the hands, mouth (diluted), clothing. It may be sprinkled about the room or used as a spray.

Izal is a thick creamy liquid. Add two teaspoonfuls to a quart of water.

Uses.—For the hands, utensils and drains and the door sheet. It may be sprayed about the room. It is not poisonous. It is cheap; one shilling bottle makes fifteen gallons of disinfecting solution.

Jeyes' Fluid and Creoline are used like Izal.

Chloride of Lime: *Uses.*—Place (with a little water) in saucers about the room. Many people dislike the smell. Two ozs. to a gallon of water is very suitable for throwing about the mouth of drains and into ash-pits.

Boiling: *Uses.*—For clothing, knives, forks, spoons, etc.

Sulphate of Iron (or green vitriol): *Uses.*—For drains and closets. Strength of solution: 1 oz. to a pint of water.

Burning Sulphur: *Uses.*—For the room after the patient has left.

Place a brick upright in an iron pail half full of water, stand on iron saucer (pan-lid) on the brick, and in this put 2 lbs. of broken sulphur for a room of ordinary size. Remove fire-irons from the room. Now close the window, block up the chimney and *all* chinks through which air may enter. Sprinkle a few drops of spirits of wine over the sulphur and set fire to it; or drop some *red-hot* cinders on the sulphur. Leave the room, close the door and block up the space between it and the door frame, as well as the keyhole.

It is a good plan to have a kettle of water heated on an oil stove in the room: the steam will help the effect of the sulphur fumes.

In place of lump sulphur "sulphur candles" can be used. These burn as ordinary candles and give off germicidal fumes.

The room is to be left shut up for twenty-four hours, at the end of which time the window may be opened from the outside, a strong cord having previously been attached to the upper sash for this purpose. If this is not practicable, leave the room another day; it may then be entered and the window opened wide.

Dry-heat is the best means of disinfecting clothing that has to be preserved. Specially constructed chambers for this purpose are now made use of in most towns. Such articles that need not be kept should be burned in the sick room, or if too large for the fireplace, passed through the window and burnt outside.

Soap.—There are various disinfectant soaps in use, but ordinary soap and water are *practically* disinfectants of a very mild kind.

Ventilation and sunlight are Nature's great means of disinfecting.

Special Points about Disinfection in Individual Fevers:—

In all cases one has to aim at disinfecting (1) the patient;

(2) the room and all its contents; (3) the discharges from the patient.

In scarlet fever.—Use carbolic oil (1 to 60) to the skin, or vinegar 1 to 4 of water.

Typhoid.—The excreta: add sawdust and paraffin, and then burn the whole if practicable; otherwise add carbolic, chloride of lime, or Izal, etc.

Typhus.—Free ventilation: spray the room.

Room Disinfection.

1. Whilst occupied by the patient.
   - (*a*) Free ventilation and good light.
     Sanitas, by means of spray producer.
     Chloride of lime in saucers, etc.
   - (*b*) A sheet is to be hung *outside* the door; it must be large enough to completely cover the door frame, to which it is fastened at the top and one side. It is to reach just to the floor. It is to be kept wet with a 5 per cent. solution of carbolic (1 to 20), or Izal.

     Its use is to destroy germs floating in any air escaping from the room into the passage.
   - (*c*) *Clothing.*—Use Sanitas (sprinkled on) for any clothing still in use.

     Soiled washable clothing should be at once placed in an earthenware vessel or wooden tub containing either perchloride of mercury (1 in 1000) or carbolic acid (1 in 40); Izal (1 in 200) or weak chloride of lime. Let them soak for an hour before removal from the room. Then put them out through the window and expose to the fresh air until dry; then wash and boil.

     Rags and articles of clothing not required again should be burnt in the room.
   - (*d*) *The excreta* of typhoid and cholera are best burnt. If this cannot be done, they must be thoroughly sterilised (sterilised means having germs destroyed).

2. After the patient has left the room.
   - (*a*) The bed-clothing should be spread about the room so that air can circulate freely through it. The room must then be thoroughly "stoved" with sulphur as already described.
   - (*b*) The walls must be rubbed with stale bread, the crumbs being afterwards collected and burnt. The wall paper must be stripped off and burnt.
   - (*c*) Wash the wall and skirting boards with a solution of carbolic or perchloride. The latter should not be used for metal things like fire-irons. A broom covered with a cloth dipped in the disinfectant is an easy means to employ when doing large surfaces. Schering's Formalin lamps are very effective for disinfecting rooms. Small lamps can be purchased at prices varying from 1s. to 10s. 6d. The Formalin is in tablets and fifteen should be vaporised for each 1000 cubic feet of space.
   - (*d*) The ceiling is to be whitewashed.
   - (*e*) Open the windows wide to afford free ventilation.
   - (*f*) Bedding should be disinfected by the sanitary authority.

The Patient.—Before the patient leaves the room he should have a bath, or be sponged all over with water containing carbolic acid. The hair should be well shampooed with carbolic soap and warm water. He should then be wrapped in a blanket sprinkled on the inner side with carbolic solution, and carried in this to another room to be dressed: the blanket is then taken back into the sick room and disinfected along with the rest of the things.

If the patient dies, the body should be completely enclosed in a cloth soaked in *strong* disinfecting solution, and the *funeral* should be attended by as few as possible.

The nurse must of course see that her own clothing is disinfected before she takes charge of another case.

The Rest of the House.—The other members of the family should avoid the sick room, and spend as much time as possible in the fresh air.

Disinfectants may be used about the passages and in the rooms, in the same manner as in the sick room.

Formalin lamps are good for this purpose. No food should be eaten after it has been in the sick room, and all feeding vessels should be placed at once in disinfectant.

The foregoing remarks apply specially to Disinfection in fever cases. There are also other cases in which disinfectants are of the greatest service, as for instance, when there is a discharging wound. Here antiseptics are used (*a*) for the wound; (*b*) with the dressing; (*c*) for the surgeon's or nurse's hands.

The surgeon will decide what particular antiseptic is to be employed.

All soiled dressings should be at once burnt, at anyrate the fresh dressings placed on a wound must be *perfectly* clean.

Inflammation.—The commonest disease which attacks any organ of the body, and the one to which every organ is subject, is inflammation. It is caused by injuries, burns, scalds, disease germs, etc.

When an inflamed part is visible it usually presents a characteristic change in its appearance as well as in its functions.

It looks *red* and is *swollen.*

It feels *hot* and tender to the touch.

The patient generally complains of *pain* and inability to use the part.

These are the great signs of inflammation, redness, swelling, heat, pain, and loss of the natural functions or power. The first three signs are due to an increased quantity of blood in the part.

The temperature and pulse are usually quickened, that is if there is fever; and if this is high, there will be thirst, loss of appetite, etc.

All the above features are well illustrated in a case of quinsy (tonsillitis), or inflammation of the knee or hip-joint.

Inflammation is often a beneficial process, and results from

Nature's efforts to repair a damage or injury to whatever cause it may be due.

It may terminate :—

1. By restoring the parts to a natural or healthy condition.
2. By forming an ulcer or abscess. An abscess is a collection of matter (pus).
3. By mortification or gangrene or death of the part. This is common when bone is much inflamed.

Some cases of inflammation are *acute*, others *chronic*.

Acute means coming on suddenly and running a rapid course. Chronic means coming on slowly and lasting a long time.

Treatment of acute inflammation.

1. *Rest* is the most important item. No other treatment may do any good to an inflamed part if it is not kept at rest. Rest means something more than merely keeping quiet. An inflamed eye is rested by excluding light by means of a bandage over it. An inflamed ear must be protected from noise.
2. An inflamed part such as a limb should be elevated : this helps to relieve the over-filled blood-vessels ; and the same end is obtained by applying cold, or sometimes by warmth.
3. The fever is treated by acting on the bowels and skin, and by giving low diet.

In chronic inflammation tonics are generally required, with good nourishing food in abundance, fresh air and out-door exercise.

Prevention of Inflammation.—So far as the nurse is concerned, this is effected by observing perfect cleanliness of everything that comes into contact with a wound (hands, instruments and dressing), and by keeping a wound as free as possible from the accumulation of discharge.

There are still a few common diseases, with the signs of which a nurse should make herself acquainted, that will now be considered.

Bronchitis is an inflammation of the inner lining of the bronchial tubes. It may be acute or chronic. The acute form occurs mostly in children, the latter in old people.

Acute bronchitis is brought on by chill, dust, teething, inherited weakness, and occurs as a complication of such diseases as measles, whooping-cough and influenza. The *cradle* is answerable for a very large proportion of cases.

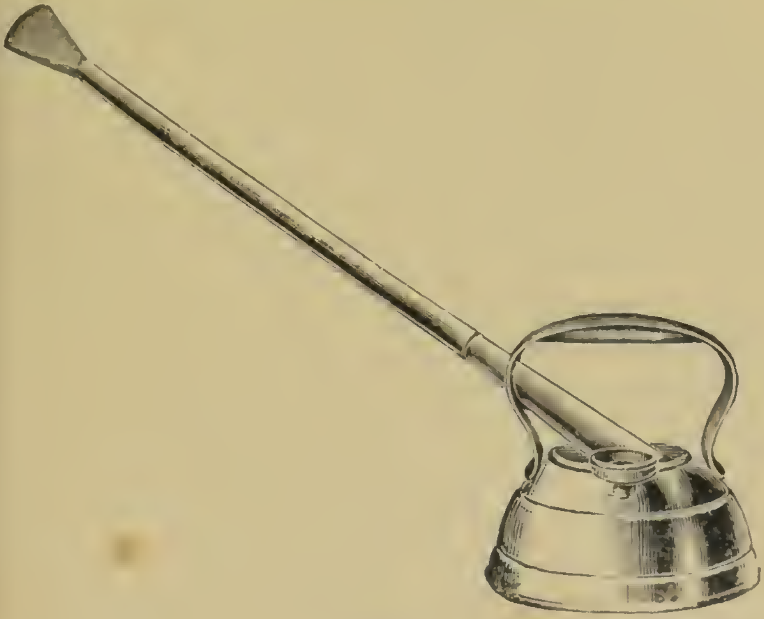

FIG. 12.

Chronic bronchitis occurs in men who work in dusty trades (miners, millers, brass-workers). It is often associated with heart disease, and this is a serious complication, generally incurable.

Treatment of bronchitis.

(1.) Acute.

The room should look south or south-west, and be kept at a temperature of 65° to 70°. The diet should consist of light and easily digested food, taken in small quantities, at frequent intervals. In the very early stage, a bronchitis kettle (Fig. 12) is often of the greatest service in moistening the phlegm and relieving the breathing. It consists of a kettle with a very long tube coming from the top; by this means the steam is conveyed into the room instead of up the chimney. A piece of tin tubing may be fitted on to the spout of an ordinary kettle.

(2.) Chronic bronchitis is extremely common in old people. Many cases bear a close resemblance to consumption and require the same dietetic and general hygienic treatment. Abundance of plain, wholesome food, warm clothing, and as much fresh air as possible. It is often due to the unsanitary state of workshops, and the inhalation of a large amount of dust, which is inseparable from certain trades.

If there is blueness (lividity) of the lips and finger-tips, stimulants must be given.

Dropsy is an accumulation of watery fluid within the body. It may be confined to one part or pervade the whole. It is caused by disease of the kidneys, heart, lungs, or liver. When the whole body is dropsical the skin has a doughy feel, so that impressions are retained. The fingers can make a depression in the skin, and this depression remains for some considerable time: the skin is said to "pit" on pressure. The puffiness of the skin often first shows itself about the ankles, or under the eyes.

Dropsy sometimes occurs after scarlet fever, and is then due to inflammation of the kidneys.

In all cases of acute dropsy the patient must be kept *in bed.* The diet, etc., will be regulated by the doctor. It is most important to examine the urine and keep a record of its amount.

In chronic dropsy when the patient is confined to bed the nursing is similar to that for paralysis (which see).

Peritonitis is an inflammation of the membrane lining the cavity of the belly or abdomen. This membrane *covers* the intestines, and when inflamed often causes them to become matted together. Peritonitis is caused by various diseases affecting the abdominal organs, and by injuries of these parts. It is very apt to follow as a result of operations involving opening into the abdomen.

Some of the commonest diseases that give rise to it are ulcer of the stomach, typhoid fever and appendicitis.

When the disease is *acute*, the patient looks very ill; the face has an anxious expression. He lies with the legs drawn up and the abdomen does not move in respiration, but the chest muscles do all the work. The pulse is small and quick, and the temperature is generally raised, though it may be normal or even subnormal. Pain is generally severe but not always, and there is tenderness. The symptoms are those, in fact, of inflammation (which see, p. 45), together with the characteristic posture. In many cases the patient cannot bear the weight of the bed-clothes to press on the abdomen, and requires some kind of cradle or other contrivance to hold them up.

Peritonitis is a *very* serious disease, and whenever it begins to show itself by the above signs, the nurse should at once inform the doctor, if he is not already aware of the fact.

The nurse may, in the meantime, apply warm applications to the abdomen and a pillow below the knees.

Appendicitis is disease of the bowel where it lies in the lower right-hand corner of the abdomen, close to the junction of the small with the large intestine. The symptoms are those of peritonitis, the pain as a rule being situated chiefly in the right lower region of the abdomen. The nurse may apply measures similar to those for peritonitis just named.

Gout.—The chief cause of this disease is excess in eating and drinking, excess in eating probably having more to do with inducing this disease than any other cause whatever.

The joints are apt to become suddenly painful, red and swollen, especially the joints of the fingers and toes. Cold applications must be avoided; the joints should be kept warm.

Rheumatic Fever or Acute Rheumatism.—In this disease many joints are notably affected at the same time, with swelling and tenderness. The pain may be so severe that it is difficult to move the patient. He should lie between blankets and sleep in woollen night-clothes.

The temperature of the room should be about 60°.

The head of the bed must not be placed in the current of in-coming air, as a cold draught is likely to aggravate the pains and fever.

All the joints, or at any rate the painful ones, should be wrapped in cotton wool.

There is usually profuse sour perspiration : this should be removed by occasional rubbing with a *warm* fluffy towel.

The disease usually lasts several weeks.

Heart disease is not infrequently a permanent result of rheumatic fever.

Paralysis may affect the nerves of sensation or the nerves of motion.

In the former case there is loss of sensation in some parts of the body ; in the latter there is a loss of voluntary control of the muscles.

The affection is usually limited to one side of the body, and may involve the whole of one side, so that the patient can neither move the leg or the arm. The condition is then spoken of as Hemiplegia, and is due to brain disease.

In other cases the two legs are paralysed, whilst the arms are unaffected. Such a condition is due to disease of the spinal cord, and has often originated from an accident to the spine.

Paralysis often comes on suddenly, as when it is associated with apoplexy. It may be caused by the rupture of a blood-vessel in the brain ; or the same vessel may be blocked with a little clot of blood, or a tiny portion of a diseased valve of the heart may become detached and lodge in one of the blood-vessels of the brain. This result is one of the serious risks of heart disease, especially that form of it that was brought on by an attack of rheumatic fever.

Paralysed muscles waste and become flabby.

Nursing of paralysed patients is one of the most difficult things a nurse is called upon to do, and especially if the patient cannot be provided with a suitable bed, etc.

Bed-sores are apt to form.

Feeding has to be done carefully on account of the difficulty in swallowing.

The bowels and bladder are often emptied involuntarily.

A water-bed is necessary in the worst cases; this equalises the pressure and is the best means of preventing bed-sores forming. In less severe cases a hair and spring mattress are sufficient, but a feather bed is not to be used under any circumstances, as it is quite impossible, with its use, to keep the patient clean and comfortable.

Two beds of the same height are an advantage, one for the day, the other for the night. The patient can be carried from one to the other on an undersheet and blanket, if the nurse has assistance. If she is alone and wishes to move the patient, she must place the two beds alongside of one another, and draw him gently from one to the other by means of the draw-sheet.

Feeding.—If swallowing is difficult, all food must be in liquid form, and given by a spoon or glass feeding-cup. The patient must not be allowed to talk or laugh whilst taking food. The amount of food required by a paralytic patient is *much* less than is needed in health; a pint of milk, a little Benger's or Mellin's food and a few rusks are sufficient for one day. Baked apples, mealy potatoes, beef-tea and jelly may also be used to make a little variation in the diet.

Bed-sores are ulcers of a very troublesome kind which occur in the skin in patients of low vitality when confined to bed for a long time, especially if not well attended to by the nurse. Paralysis is one of the conditions in which they are likely to occur, sometimes even in spite of every care.

The actual cause is *pressure* on the skin; from this it follows that the sores form on those parts that receive most of the weight of the body, namely, the lower part of the back, the hips and the heels.

When a bed-sore is about to form, the skin first looks red or purplish, next it becomes boggy, afterwards the skin mortifies. The mortified part is gradually cast off, leaving an ulcer or open sore. A bed-sore is painful, though not always so; there is a discharge from it. There is always a risk of pyæmia (blood poisoning) being set up, and this may cause death.

Prevention of bed-sores:—

(*a*) The bed-clothes underneath the patient must be kept smooth and free from crumbs and moisture.

(*b*) Perfect cleanliness must be observed. The under-sheet must be changed immediately after getting wet or in any way soiled. If the patient perspires much, the skin should be frequently wiped with a warm soft towel.

(*c*) The patient's position in bed and his posture should be changed every few hours.

(*d*) An air-cushion is useful for the patient to lie upon, the hole being opposite the point of greatest pressure. A ring of tow or cotton-wadding may be similarly employed. The ring shape may be retained by wrapping roller bandage round the ring.

(*e*) Applications to the skin.—Methylated spirit, mixed with an equal quantity of water, should be *rubbed* over the whole back at least once each day; it hardens the skin. Brandy, Eau-de-Cologne, or whisky may be used in the same way. After the skin has thus been rubbed it should be dried, and powdered with fine oxide of zinc, Fuller's earth or boric acid.

Cure of Bed-sores.—The same rules that are to be observed in preventing the formation of bed-sores must still be continued after they have formed; in addition to which some special application will be needed for the sore itself, but this latter point must be left to the medical attendant to prescribe.

A draw-sheet and protector should be used in cases of paralysis.

OBSERVATION OF THE SICK: SPECIAL SIGNS AND SYMPTOMS

A "SIGN" is anything visible to the onlooker; a "symptom" is what the patient experiences. For instance, in an inflamed part the redness and swelling are *signs*, the pain is a symptom. This is the strict meaning of these two terms, but they are often used indiscriminately one for the other.

There are several signs and symptoms of disease which the nurse must know about.

Posture.—One of the first points to notice on entering the sick room is the way the patient is lying or sitting; this posture often conveys a lot of information about the patient's condition.

For posture in Injuries refer to "First Aid." A patient assumes that attitude or posture which causes the least pain, or gives the greatest relief to a painful part. The nurse should observe what posture affords most relief. A change so slight as to be almost imperceptible to an onlooker may make all the difference to the patient between pain and ease, wakefulness and sleep.

The *natural position* of rest (lying down) is on the side with the arms folded in front of the chest, and the legs more or less drawn up. The patient lies on his back with all his limbs fully extended, and the head as low as it can get, in all conditions of great prostration from lingering disease, such as typhoid fever, in stupor, and for some time before death.

Inability to lie down indicates embarrassment of the heart and lungs, usually both, as in asthma and advanced heart disease. Some such patients cannot rest in bed at all, and are obliged to sit upright in an arm-chair, and even sleep in this posture. It is a good sign when such a patient is able to lie down or recline backwards against a bed-rest. Difficult breathing is termed "Dyspnœa," and when so bad that the patient cannot lie, "Orthopnœa."

The patient may only be able to lie on one side in pleurisy or injury to the ribs.

Lying on the back with the head raised and the knees drawn up is an almost certain sign of inflammation in the abdomen. If only *one leg* is drawn up, it may mean hip-joint disease.

Bending forwards and pressing the fore-arms on the abdomen means spasms or colicky pains in the bowels.

Retraction of the head is found in inflammation of the brain and upper part of the spinal cord (meningitis—"brain fever"). It is a serious sign.

The whole body bent backwards occurs in lockjaw (tetanus).

The nurse must guard against keeping a patient, especially a patient advanced in years, for too long a time on his back. The same is true for those who are debilitated, or who have a weak circulation. Such a position if long continued may lead to "congestion of the lungs." An old man with fracture of the thigh should be propped up for a short time two or three times a day.

Caution.—In heart disease and diphtheria the nurse must be extremely careful not to let the patient sit up suddenly, nor to raise him quickly herself. This has frequently produced fatal "syncope" (fainting). When such a patient first begins to change the recumbent posture, the proper thing to do is first to place an extra thin pillow under the head. If he feels all right, a thicker pillow may be substituted after a while, then two pillows, and so on, until a bed-rest can be used.

In introducing another pillow or cushion it should be pushed *below* one already in position.

Various things that can be used by the nurse in helping a patient to maintain a desired posture:—

Pillows may be used to support the patient sitting or side-ways; under the knees when his back is against a bed-rest; under the leg (lengthways) to take off pressure from the heel; to steady an injured or inflamed leg or arm; to place against a bed-rest.

Sand-bags made the length of a stocking and *half filled* with dry silver sand, are useful for steadying a leg.

Bed-rests are various contrivances placed on the bed, behind the patient, against which he may lean at various angles. The best kind is one, the slope or angle of which can be altered to suit the patient (Fig. 13). Those made with canvas backs are the cheapest.

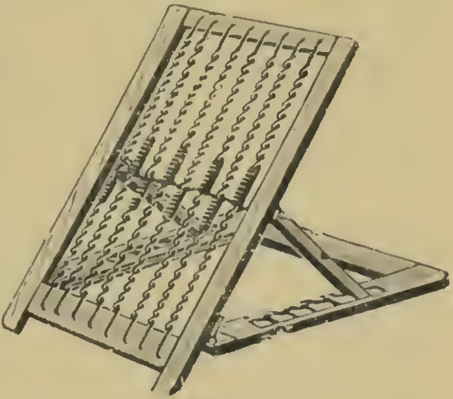

FIG. 13.

An improvised bed-rest, and one which answers the purpose admirably, can be made with an ordinary Windsor or cane-bottomed bedroom chair, by placing it upside down so that the back of the chair is next the patient, the ends of the two front legs projecting between the metal frame-work of the bed-head. The chair can be fixed by means of rope or handkerchiefs. One or more pillows will be required. If the patient gradually slides down, place blocks (bricks or books) under the *foot* of the bed. The lower end being thus raised will help to keep the patient in position.

A roller towel, or strong rope with a thick stick for the hand to grasp, fixed to the foot of the bedstead, is useful for the patient to pull himself up by, when he is well enough to sit up in bed. Sometimes a rope can be fastened to the ceiling for the same purpose. It should hang above the patient's chest.

Another useful thing in certain cases is a thick hard cushion placed in the bed for the patient to press his feet against.

Pain is the symptom of which most patients complain, and for which they seek relief. It is a symptom of inflammation, but other signs or symptoms are usually present along with pain, according to the part or organ affected, for instance:—

Delirium in inflammation of the brain, intolerance of light when the eye is affected. Pain in the side of the chest, increased on taking a deep breath, occurs with pleurisy. Pain is severe when a joint is inflamed.

Pain may be due to other causes than inflammation, for instance:—

1. Neuralgia: this has a tendency to occur about the same hour each day.
2. Hysteria.
3. Flatulence, etc.

The site of pain does not always correspond to the seat of disease causing it. In hip-joint disease, pain is occasionally chiefly complained of in the knee. Pain may be caused in any part of the face by a decayed tooth; in the back by disease in the pelvis, etc.

Pain in the head is due to many causes: the disease may be in the head itself, such as tumour or inflammation; defective eyesight; disease of the kidney or liver.

Severe pain in the backbone (spine) made worse by standing, or coming down stairs, is due to spine disease.

"Growing pains" mean rheumatism.

A "girdle pain" round the abdomen, occurring at intervals, and lasting for some weeks, means disease of the spinal cord.

Two of the most intense kinds of pain that anyone can suffer from are caused by angina pectoris and stone in the kidneys. In angina pectoris the pain comes on suddenly in the chest and left arm and is accompanied with a feeling of impending death. When a stone passes from the kidney into the tube (ureter) which conveys urine to the bladder, the pain is often excruciating, coming on at frequent intervals, and lasts until the stone is forced out of the tube. It shoots from the back to the groin.

People vary in their susceptibility to pain. What will cause an almost intolerable pain in one person will scarcely be felt by another one.

The nurse must note the following points with regard to pain:—

1. Its situation.
2. Its character—sharp, dull, shooting, burning, etc.
3. When it occurs.
4. Whether increased by movement.
5. What gives relief.

Treatment of Pain.

Rest the part: this is the most important point. Fix a joint or limb by sand-bags or pillow. An inflamed eye must be protected from light. An inflamed ear from loud noises. An inflamed stomach must not receive food.

Elevation of the Part.—This encourages the circulation and partially empties the blood-vessels. The reader can observe this by holding one hand high above the head for fifteen to twenty seconds, then bring it down and at once compare it with the other hand that has been allowed to hang down. The veins will be almost, if not quite, invisible, showing that they are emptied of blood.

Heat and Cold.—Cold as a rule is best in the early stage of inflammation; heat in the later stages.

Ice bags are constructed of waterproof material. The ice should be placed in a towel and pounded with a flat-iron into small pieces. The bag should be covered with flannel to keep it cool. A sponge-bag does well for ice.

Heat is applied by means of—

Poultices (linseed, bread, etc.).
Fomentations (flannel wrung out of hot water).
Hot douche.

Drugs must be used if other means fail. Opium in some form (morphia, chlorodyne, Dover's powder, etc.) is the drug most frequently employed.

Patients and nurses must never lose sight of the fact that there is *always* a danger of contracting the opium or morphia habit if the drug is frequently resorted to, and especially if the patient is allowed to prescribe it for herself.

There are **Three Important Signs** which are generally considered together, from the fact that they bear an important relationship to one another, and afford the most important indication of the patient's condition in the vast majority of illnesses. These are the temperature, the pulse and the respiration.

Temperature.—The temperature of health is 98·6, that is, the body is warmer than the surrounding atmosphere. Even in summer, the temperature of the air seldom exceeds 90°, and then only for brief periods, whilst in winter it often goes below the freezing point (30°).

Our bodies are kept warm by the intense production of heat derived from combustion of food, chiefly in the muscles and glandular organs, especially the liver. The body parts with its heat chiefly from the skin and respiratory passages. The remarkable thing is the fact that, in health, production and loss of heat are so balanced, that the temperature of the body remains practically constant, whatever be the age, season, climate, occupation, or diet. When the external temperature is high, a large amount of warm blood is attracted to the skin, perspiration occurs, and the evaporation of moisture from the surface carries off the necessary amount of heat. During exposure to cold, the opposite conditions take place, and in addition there is actually an increased production of heat within the body.

The variations of circulation and heat production are controlled by the nervous system. In disease this controlling mechanism may be disturbed, with a consequent rise or fall of the body temperature. In fever there is an increased heat production, without a corresponding loss.

Variation of the temperature in health.—From two to four o'clock in the morning it is lower than at any other part of the twenty-four hours. It is highest about three o'clock in the afternoon. The vital powers are lowest in the early morning hours.

Local variations.—The exposed skin is colder than the covered portions. It is colder after washing.

Variations in disease.—It is *depressed* after severe hæmorrhage, in starvation, some wasting diseases, collapse of typhoid fever, poisoning, cholera, alcoholic excess, heart disease, and dropsy. There is danger if the temperature fall below 95°.

It is *raised* in most fevers and acute inflammations.

Treatment.—For low temperature: apply warmth to the surface, hot blankets, hot-water bottle or hot brick to the feet, plates, oven shelf, etc. Give strong hot coffee.

For high temperature,

(1.) Cold bath, with water at 95°, gradually reduced to 70° by adding colder water.

(2.) For sunstroke with very high temperature, benefit is got from rubbing the surface with small blocks of ice until the body becomes cooler.

(3.) In mild cases, a wet pack or cold sponging is beneficial.

The Wet Pack.—Wring a blanket out of cold water, and wrap it round the naked patient, changing it at least once every twenty minutes.

Rigor, or shivering fit, as already mentioned, indicates a rising temperature. The skin, however, may look pale and bloodless. It occurs not only at the commencement of fevers and certain inflammations, but at irregular and uncertain times during the course of such diseases as pyæmia (blood poisoning) and peritonitis. The patient should be well wrapped in warm clothing, have warm drinks and a hot bottle to the feet.

The Pulse.—Here one has to take note of the following points :—

a. Frequency. The normal rate in the adult is 72 per minute.

b. Rhythm, that is its regularity or irregularity.

It is said to be "intermittent" if it is regular except for an occasional beat, which is altogether missed.

It is "irregular" when there is a considerable variation in the beats.

c. Force or strength. This cannot be described; it can only be learnt by getting accustomed to the feel of a normal pulse.

d. The thickness or hardness of the artery. In children and young people the arteries are soft and easily compressed by the finger. As age advances they become harder and more brittle—sometimes having the feel of whipcord. In most elderly people and in those who are prematurely old, the pulsations of the temporal artery are visible, and the vessel has a tortuous appearance. The pulse should be felt whilst the patient is quiet; any effort or excitement makes it beat faster. This is especially true in the case of children.

Signs connected with the respiratory organs:—

Respiration.—The normal rate is eighteen to the minute. A complete respiration consists of two acts: inspiration (breathing in) and expiration (breathing out).

The diaphragm is a sheet of muscle stretched across the body so as to divide the chest (or thorax) from the belly (or abdomen.) When it contracts it sinks lower, so that the chest is increased in depth, and the liver and other abdominal organs near it are pushed downwards, and the abdominal wall forwards, at each inspiration. There are also several muscles acting on the sides and upper part of the chest, which cause it to expand laterally and in front.

The abdomen moves most in men and children, and the upper part of the chest in women.

It is important to observe these movements during illness.

In peritonitis the respiration even in men becomes thoracic—*i.e.* there is no visible movement of the abdominal wall in front.

In Cheyne-Stockes breathing the respiration is observed to stop *completely* for some time—five to fifteen seconds or more—then to recommence, the movements becoming deeper and deeper and then gradually stopping again.

This generally indicates the near approach of a fatal termination.

Count the respiration without the patient being aware of what is being done. A good plan, if he is awake, is to feel the pulse as though counting *it*.

Ratio between Temperature, Pulse and Respiration.—An elevated temperature quickens the pulse and the breathing: a fall of temperature has the contrary effect.

A "*chart*" should be used on which to keep an exact record of these three signs as observed night and morning, or oftener if necessary (see chart, p. 35); 9 a.m. and 7 p.m. are convenient times. The quantity of urine, the action of the bowels, are also marked on the same chart.

Cough is almost invariably present in disease of the air passages, the lungs or the pleura (lining membrane on the surface of the lung).

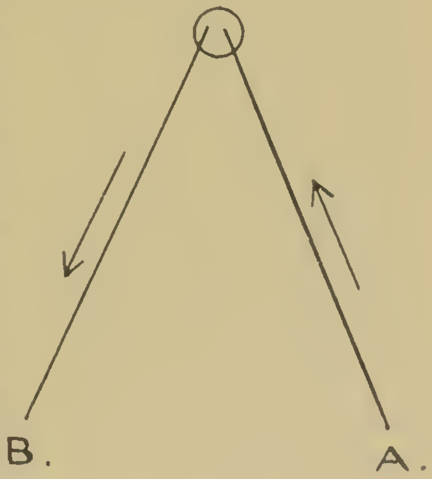

FIG. 14.

When phlegm is formed in excess of the normal quantity, if it were not got rid of by coughing, it would block up the air passages and cause suffocation.

When phlegm is coughed up from the chest and not expectorated, it goes down the gullet into the stomach.

Cough is an illustration of what is called in physiological language a "reflex action." If a man using a telephone A (Fig. 14), wishes to speak with another at the telephone B, he rings up the Exchange, and the operator there puts him into connection with B, the connection being made at the Exchange. This is comparable to what occurs in coughing. There is some irritation, say, in the windpipe (A); this irritation causes a nerve current to travel along a nerve to the brain (Ex.), and the brain causes an impulse (nerve current) to travel down the nerves to the abdominal muscles (B). These (with other muscles) suddenly contract, the chest is compressed, and the phlegm expelled with the outrush of air.

Other examples of reflex actions are swallowing, sneezing, vomiting, secretion of saliva and gastric juice, blushing, laughing, crying, the flow of tears, etc., etc. A reflex action is one over which we have little or no control.

When any food attempts to go the wrong way (*i.e.* into the windpipe), there is a violent reflex cough produced to prevent it entering (Fig. 17).

Other *causes* of cough are elongated uvula, overfilled stomach, irritation of the nose, hearing other people cough (as in church).

Varieties of Cough.—It may be dry or moist, that is, with or without expectoration.

The whoop as in whooping-cough.

The loud bark of hysteria.

Catching cough in pleurisy—often causing the child to cry.

Frequent hacking cough of phthisis.

Suffocative unsatisfying cough of asthma.

Expectoration or sputum means all matters coughed up or spat out.

Its exact character should be noticed, and it should be kept for the doctor to see.

It is bluish in early bronchitis; rusty-red colour and extremely sticky in pneumonia; mixed with yellow matter in chronic bronchitis and late phthisis. Blood may be present.

Hæmoptysis means spitting of blood. It may be produced by straining, or may indicate disease (such as Phthisis). Young children do not expectorate except with whooping-cough.

All phlegm should be burnt or mixed with disinfectant or buried. A sputum cup should be used. It will often save a good deal of trouble if a stout paper lining is inserted in the cup. This lining holding the sputum can be burnt several times a day. The cup should be washed out with boiling water at least once each day.

The Breath.—Poisons, such as prussic acid, alcohol and laudanum impart their own peculiar odour to the breath.

Certain diseases impart odours which can be detected by those with an acute sense of smell. The breath is fetid with decayed teeth, diseased bone, and ulceration of the mouth or nose.

Symptoms connected with the Digestive System.

Vomiting is an early sign of most fevers. It is produced very much by the same mechanism as cough, but the entrance to the windpipe is kept closed.

Causes.—The commonest are those directly affecting the stomach, such as excess of food, improper food and imperfect mastication (" bolting "), indigestion; poisons such as arsenic, mercury, strong acids, decomposing food, alcohol; disease of the stomach, as ulcer, cancer, great dilatation; disease of neighbouring parts, as gall-stones in the liver, constipation.

Vomiting due to any of the above causes is accompanied by a good deal of retching and straining. A *feeling* of sickness precedes it.

There is another type of vomiting where the matters are suddenly ejected, often without any warning, such as nausea or discomfort about the stomach—it is known as " cerebral vomiting," because it is due to disease or irritation of the *brain*. Vomiting at the commencement of fevers is generally cerebral.

In gastric vomiting the stomach rests after it is emptied and vomiting ceases, but no relief is afforded by the act of vomiting when it is due to cerebral causes, and the patient will continue to make the effort to vomit when there is nothing to bring up. Vomiting may also arise reflexly from tickling the throat, from thread worms in the lower bowels, from earache, etc.

The nurse should observe with regard to it:—

When it occurs, its character, and the nature of the vomit, especially the presence of undigested food, blood, bile and the presence of offensive odour. Sometimes children vomit large masses of cheesy-looking matter; this is the curd of milk, and shows the necessity for modifying the diet.

Treatment.—Keep the patient quiet in a reclining position with the head *low*.

If possible, remove the cause of the sickness. Give no food.

Small bits of ice swallowed at intervals are often useful.

Weak brandy and soda water may be tried.

Sherry whey, in teaspoonful doses, is very useful for vomiting in fevers.

For vomiting due to putrid food, and overfilled stomach, it is well to encourage it by giving warm water to drink, or salt or mustard and water, in order to thoroughly empty the stomach. For corrosive poisoning, one must give milk, egg and milk, thick barley or oatmeal water.

Diarrhœa: *Causes.*—Improper food is the commonest; it may have begun to decompose. This is the case very often with milk in the old-fashioned feeding-bottles. Diarrhœa causes many deaths among young children, and will continue to do, until mothers are better trained in the proper feeding of them.

Everyone should know (1) that an infant should, whenever possible, be brought up on the breast; and (2) if fed artificially, the only food that should be given until it is nine months old is milk, modified if necessary by the addition of water, barley-water or lime-water. No other food whatever should be given except by the doctor's orders.

Absolute cleanliness of all vessels containing food must be observed (see *Food in Health and Disease* for further particulars).

Summer diarrhœa is a serious disease; it is sometimes called "English cholera." It is due to decomposed or contaminated milk. Any cause which leads to indigestion of food may set up diarrhœa; such as bolting, bad cooking, etc.

Unsanitary surroundings may cause it. It occurs as a symptom of such diseases as typhoid, dysentery, etc.

The nurse should notice the frequency of the action of the bowels and the character of the motions, as to (1) consistence, (2) colour, (3) odour, (4) foreign or abnormal ingredients.

Worms may be present. They are of three kinds:—

1. Small thread worms, like bits of white thread, a quarter of an inch in length.
2. Round worm, very like the common earth worm, but of a pale colour.
3. Tape worm, flat like tape, in sections or joints.

Treatment of Diarrhœa.—A little diarrhœa is often the means of getting rid of some irritating substance from the bowel. In children it should always receive prompt attention, especially in summer. If the patient has been living largely on milk, leave it off *entirely* for twenty-four to forty-eight hours, and give nothing but mutton-broth, chicken-broth, water, arrowroot and barley-water. If the diarrhœa does not stop soon, call in the doctor.

Appetite and Thirst.—Loss of appetite and a craving for drinks are common throughout the early stages of fevers.

It is of little use to force food on the patient if there is no desire for it, and indeed it may do positive harm. During fever there is little or no gastric juice secreted, and the stomach must be supplied only with food that requires little or no effort to digest it. There *are* some exceptions, but it is not necessary to mention them here.

When the appetite begins to return it is a good sign, but even then there is a danger of giving the patient too much.

Appetite and thirst are excessive in diabetes.

The best drinks to quench thirst are water, acidulated water, barley-water and albumin water (made with the white of egg).

Tongue.—This often gives important indications. The nurse should notice anything unusual in its appearance as to colour, moisture, coating, ulcers, etc.

It has a raspberry or strawberry look in scarlet fever; becomes dry and brown in typhoid and typhus.

It is a favourable sign when a tongue long dry becomes moist.

After being thickly coated, it clears first at the tip and edges.

Signs connected with the Nervous System.

Sleep.—Every organ of the body requires a certain minimum amount of rest in which to repair. Sleep is the resting time of the brain.

The amount required varies considerably. Young infants need twenty hours out of the twenty-four. Children up to ten years old should sleep at least twelve hours, and from fifteen to twenty-five years, eight hours is the minimum.

Less sleep is needed if it is sound and refreshing, than if it is restless and broken. Unhealthy sleep may be of three kinds, (1) excessive, (2) defective, (3) unnatural.

1. *Excessive Sleep* occurs in idiots and imbeciles, and in certain other diseased conditions.

2. *Defective Sleep.*—The nurse will not unfrequently notice that the patient sleeps well and long, though he complains of not sleeping. Patients often sleep much longer than they think they do.

Insomnia or Sleeplessness.—The patient may be a long time in going to sleep, or he may fall asleep quickly, but waken up soon and not go to sleep again. Such a condition may considerably retard his recovery.

Causes.—Mental worry and overwork; excitement; excessive use of tea, coffee and tobacco; cold feet; too high a temperature of the room; food too near bedtime; flatulence, noises, etc. Chronic alcoholism leads to a state known as *delirium tremens*, in which the patient will pass whole days and nights consecutively without a moment's sleep. It is a dangerous condition, and one that requires the most careful vigilance on the part of the nurse. It differs from ordinary delirium (to be presently described) in that the muscles, especially those of the hands and face, are very tremulous: if the patient attempts to grasp an object his hands shake, and he may be unable to hold it.

Heart disease often interferes with sleep, as also does chronic bronchitis. Severe pain from any cause will keep the patient awake more or less.

3. *Unnatural Sleep.*—This seems to be due to the activity of one portion of the brain at a time when it ought to be quiescent along with other portions that are resting. For instance, this occurs when people *talk* in their sleep; others, called somnambulists, occasionally *walk* whilst sleeping, and may sustain serious accidents in consequence. Epileptic attacks and convulsions may occur only whilst the patient is sleeping.

Treatment of Sleeplessness.—Remove as far as possible all disturbing influences.

For the overworked—the brain-weary—nothing is so efficacious as a change of scene and air. A few days away from home, with congenial friends, or at a comfortable Hydro, *together with entire change of occupation*, will do more for the benefit of the patient than any drug can possibly do.

For cold feet, one must use a hot brick or water-bottle.

Weak patients who take little food should have some warm broth last thing at night.

Old people who feel cold should sleep in blankets.

The door-knocker and bell may require to be muffled, or tan laid down in the street in front of the house to deaden the sound. For the latter, permission must be got from the Road Surveyor.

Delirium or Mind-wandering.—This is extremely common in fevers, acute severe inflammations, and poisoning.

In fevers it occurs when the temperature is highest, often as the rash is coming out. In small-pox after pustules begin to form. In typhoid, during the time of prostration.

Even in the worst cases there are often lucid intervals; times when the mind is clear and the patient talks rationally.

There are three types of Delirium:—

(*a*) *Low muttering*.—Here the patient lies still, taking no notice of what is going on around him, muttering unintelligible words, as though talking to some one at the same time that he appears to be half asleep.

(*b*) *Delirium tremens* (see p. 66).

(*c*) *Raving*.—Here the patient is for the time being actually *mad*. He talks aloud and incoherently. He is almost always very restless, and often violent and difficult to restrain.

This condition occurs in acute mania, and sometimes in meningitis, pneumonia, etc.

The patient may suffer from illusions, delusions and hallucinations.

An Illusion is the wrong interpretation of some visible object or sound: for instance, the patient may believe a pattern on the wall-paper to be a living animal—generally one of which he is afraid.

A Delusion means a mistaken idea. A poor man may consider himself a wealthy prince; a pond of water he may talk of as being the Atlantic Ocean. He often imagines people are trying to kill or injure him, and, in consequence, he does things for which he is not responsible.

A Hallucination expresses that condition in which the patient speaks of or sees objects that do not exist *except* in his own imagination. He may say that rats or other creatures are running over his bed, and he will make a grab at them. If the nurse pretends to catch or banish them he is generally satisfied for the time.

The nurse should always have beef tea or other restoratives at hand to give the patient the moment his mind shows the least sign of wandering, and if she anticipates the onset by the timely administration of stimulating broth she will often be successful in altogether warding off an attack of delirium.

Loss of Consciousness occurs in sleep: anæsthesia from chloroform, ether, nitrous oxide, opium and other brain poisons; syncope (fainting); asphyxia (suffocation); fits (apoplexy, epilepsy); coma from kidney disease (uræmia) and diabetes, and in many diseases shortly before death.

In all cases of mental aberration the patient should not be left alone; in *delirium tremens* and violent delirium *not for a single moment*. All windows should be guarded, and cutting instruments, rope and such like, should not be within the patient's reach.

During low muttering delirium from exhaustion such strict watch is not required.

Coma means loss of consciousness due to disease, and from which the patient cannot be aroused. The patient is said to be *comatose* or in a state of coma.

Convulsions (see also *First Aid*). As a rule there is sudden loss of consciousness and a violent spasm or rigidity of the muscles. The whole body may be affected, or only one side. The hands become tightly clenched. Then the rigidity gives place to twitching or jerking movements of the head and limbs which gradually cease; followed by a stage of stupor which may last several minutes or only a few seconds. There may be no loss of consciousness. Sometimes, especially in epileptic convulsions, there is frothing at the mouth.

It is often of the greatest importance to ascertain in which part of the body the convulsions *commence*, and the nurse should try to find this out by careful observation. Convulsions can sometimes be cured by trephining the skull (making an opening so as to expose the brain), and the precise spot where it should be done is often indicated by the muscles first convulsed.

Causes.—The chief causes are—

An acute febrile condition, such as fever or pneumonia.

Injury at birth, giving rise to infantile convulsions, followed by paralysis of a part of the legs or arms.

Childbirth: occurring in the mother after the birth of the child.

Uræmia: here they are due to kidney disease.

Meningitis, or brain fever.

Hysteria, epilepsy, apoplexy (see *First Aid*).

Hysterical patients are careful, in falling, not to hurt themselves. If in doubt press the tip of the finger on the surface of the eyeball: a hysterical person will try to close the eye; an unconscious person will not do so.

Tetanus or "lockjaw" produces violent convulsions. Some poisons have the same effect, especially strychnine.

Hydrophobia: produced by the bite of a rabid animal.

Chorea or "St Vitus's Dance": here the muscles are unable to keep still for long; the face, arm, leg, or whatever part is affected gives sudden little jerks which the patient is unable to control. The tongue after being protruded is drawn in very suddenly.

Other common and immediate causes of convulsions in children are:—

Irritation of nerves: as in teething, over-eating, worms.

Fright.

Change in breast milk produced by mental shock in the mother.

There is generally a susceptible condition of the nervous system.

Treatment.—Loosen all tight clothing about the neck and chest, and lay the patient flat with the head slightly raised. See that he does not injure himself.

One of the early signs of convulsions, appearing sometimes a long while before the fit, is bending the thumbs into the palm of the hand; this should always be a warning, and means should be adopted to ward off the threatened attack, by medicine, if at hand, a warm bath up to the waist, or an emetic if the stomach is overloaded.

Urine.—The normal daily quantity in an adult is 50 ozs. (five tumblerfuls). The nurse should note any change in colour or transparency, and if there is a visible deposit.

"Retention" means accumulation in the bladder. This may be brought on by paralysis. If retention is not relieved the accumulated fluid may produce great enlargement of the abdomen, and the bladder may reach as high as the navel or even beyond. An instrument called a catheter is used to draw off the urine.

Incontinence of Urine means that the bladder is unable to retain it for the usual length of time.

Many times when the patient complains of incontinence and continuous dribbling of water, the real condition is one of retention, and what comes away is the overflow after the bladder is already distended.

Two of the most important changes in the composition of the urine are produced by certain forms of kidney disease resulting in the presence of albumin in the urine, and by diabetes in which sugar is present.

When albumin is present the condition is termed albuminuria. When healthy urine is heated to the boiling point no marked change occurs: but if albumin is present a white curdy substance becomes visible and falls to the bottom in an insoluble condition. It looks very much like white of egg, with which indeed it is almost identical.

This condition exists when dropsy follows scarlet fever, and from many other causes.

In diabetes, there is sugar in the urine in considerable amount. The quantity of urine excreted is often twice the normal amount and may be even more. There is generally great thirst and desire for solid food.

The Skin.—There are two layers: the superficial one contains no nerves or blood vessels: it is the portion raised up when the skin is blistered. It is known as the "cuticle" or "epidermis." The deep layer is the "true skin" or "cutis." It contains blood-vessels and nerves concerned in the special sense of "touch."

In desquamation after scarlet fever, measles, etc., it is only the surface portion of the epidermis that is cast off. This is easily renewed without leaving any permanent mark. If the true skin is destroyed, a scar or "cicatrix" always remains as a permanent sign of the injury.

The skin also contains sweat glands and in hairy parts sebaceous glands.

The skin is an extremely important structure, serving several purposes, especially that of regulating the temperature. A good deal of a nurse's time is occupied in attending to the skin in one way or another.

Not only does perspiration come *outwards* through the skin, but substances may pass in the opposite direction and thus gain entrance to the blood from the outside of the body. Disease germs may thus pass, and so may certain drugs.

The chief things to note are the following:—

1. Itching: this is present in many diseases.
2. Conditions as to moisture: increased in rheumatic fever, in the night sweats of phthisis, etc., sweating especially about the head in rickets.
3. Colour: pale in anæmia (poverty of blood) and in fainting.
   Yellow in jaundice.
   A bright red patch appearing at intervals on the cheek in consumption.
   Purple in the Blue disease (cyanosis).

Rashes of fevers have already been described. Blood may occur underneath in bruises and in certain diseases such as *purpura*, when numerous small red spots occur that cannot be obliterated by pressure of the finger, and are not raised: such a spot is called a *macule*. A small raised spot is called a *papule*, one containing watery fluid a *vesicle*, and one the contents of which is pus or "matter," a *pustule*.

In erysipelas, an extensive redness occurs, with an ill-defined margin.

When the skin is cut or torn we get a *wound*. An open sore that heals gradually is called an *ulcer*.

If the skin is so damaged that a visible portion dies, we get what is termed *gangrene* or *mortification*.

The *veins* may be enlarged and knotty; they are then called varicose veins.

Œdema is a watery puffy condition found in dropsy.

The hair should be glossy: if dull, it indicates a low state of health.

Ringworm is a contagious disease contracted by contact. It occurs in red scaly patches of a circular shape.

Pediculi or lice are evidence of neglect. There are three kinds. One infests the head, another the rest of the body, and a third is found in clothing.

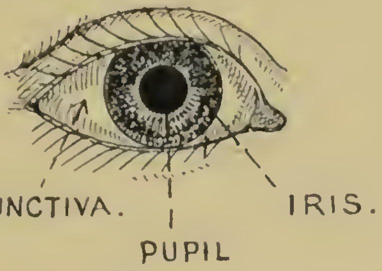

FIG. 15.

Nits are the eggs of the lice found in the hair of the head.

Stavesacre Ointment is one of the best cures.

When the clothing is infested it must be changed frequently and boiled.

Itch is due to a little insect that burrows into the skin: it causes a pustular eruption especially about the fingers.

Dirt is a common cause of disease.

The Eye often gives important information. The black centre is termed the *pupil;* the coloured ring is the *iris;* the white of the eye is the *conjunctiva* (Fig. 15).

The pupil may be contracted to the size of a small pin-head, as in opium and morphia poisoning.

It is dilated beyond the usual size in belladonna poisoning, in alcoholism, and in apoplexy. Also in poisoning by prussic acid, henbane and laburnum seeds. In fainting, in coma and uræmia.

Squinting should be noted: this occurs with brain disease, and during convulsions.

Photophobia means intolerance of light. If there be discharge it should be removed and the eye kept quite clear of it, by means of an indiarubber ball syringe that can be used with *one* hand. This is much preferable to a glass one that requires both hands.

In applying a lotion by means of a syringe the eyelids must be separated as far as possible, and turned outwards, so that the lotion gets underneath.

If it has to be put into the eye only in drops, a dropping tube may be used (Fig. 16). The rubber portion is compressed *slightly*, whilst the glass point is in the lotion; on taking off the pressure a small quantity of the liquid will enter the tube. This is then dropped into the eye by again compressing the rubber.

A separate towel should always be used by anyone with an inflamed eye, as many of these cases are extremely catching, and occasionally one will find every member of a household affected.

If the eye of an infant seems at all inflamed a few days after birth, it is of the utmost importance to have it properly treated, and the doctor should therefore be informed of the fact *at once*. Such cases if neglected frequently end in loss of sight.

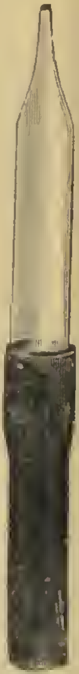

FIG. 16.

Pain around the eye is often due to defective sight and is remedied by wearing suitable glasses.

The Nose.—Posteriorly the nose opens into the pharynx, which is continuous below with the gullet, or food tube, leading to the stomach (Fig. 17).

The nose is the natural channel for the entrance of air in breathing. When anyone breathes habitually through the mouth, it is a sure sign of obstruction in the nostrils, or in the pharynx just behind. The nose also detects smell and flavour. The nostrils are specially adapted for producing three important changes in the air, namely: they warm it,

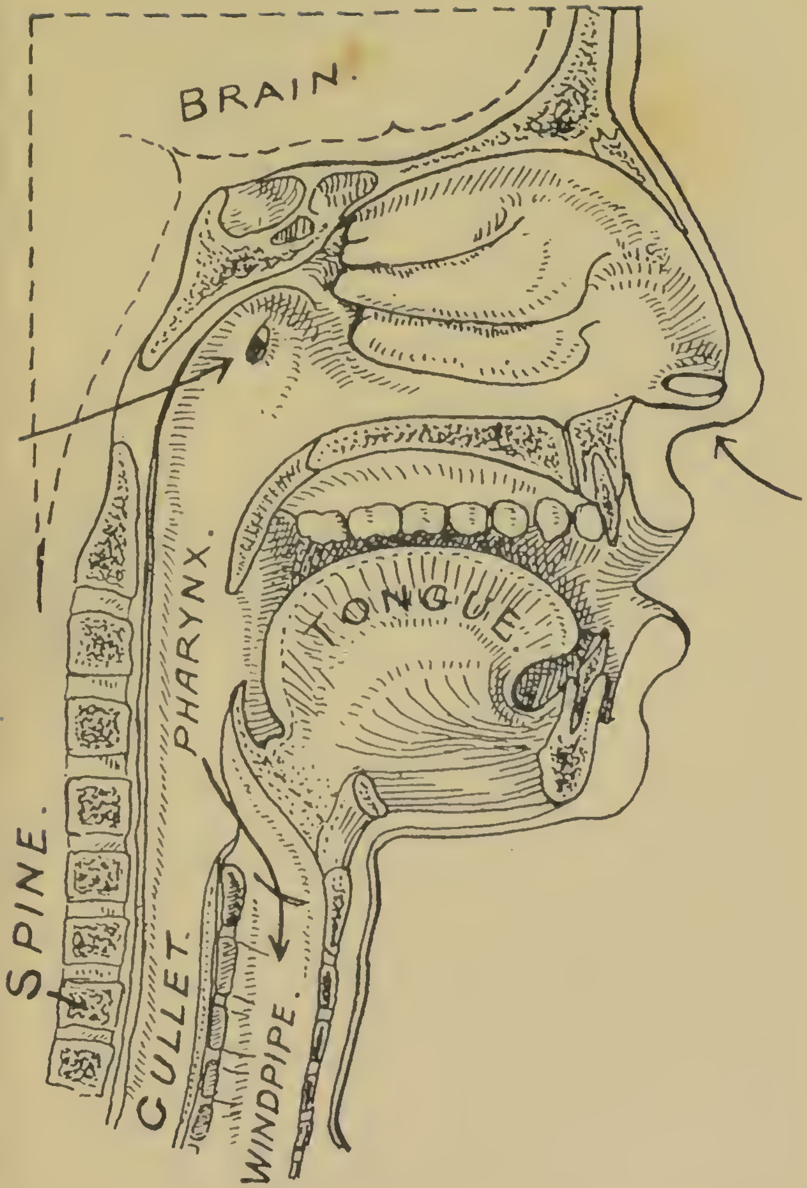

FIG. 17.

moisten it and intercept a good deal of dust, thus rendering it fit to pass into the lungs. These changes are imperfectly effected when one breathes through the mouth.

Nasal obstruction may be due to (1) a narrowing of the passages; or (2) an accumulation of discharge.

Very young children cannot blow their nose, and if it becomes blocked by secretion, the greatest benefit is produced by forcing *air* through the nostrils from a ball syringe, such as that shown in Fig. 18.

For older children and adults it will be necessary to use a lotion which the doctor must suggest.

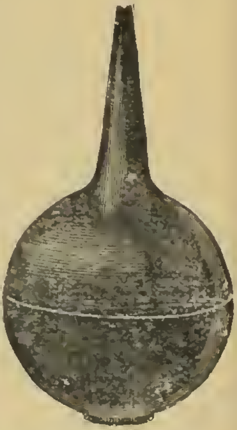
FIG. 18.

The Ear.—The ear consists of three portions.

1. The external ear, including all that part visible externally, together with the canal or "ear hole." The latter is about 1 inch long in the adult. The inner end of the canal is closed by a thin partition called the "drum membrane," which divides the external from the middle ear or drum.

2. The drum or middle ear is a space containing air. A little chain of bones stretches across from this space, being attached to the drum membrane on the outer wall and on the inner wall forming a connecting link with—

3. The internal ear. This is a complex series of hollow passages in a very hard bone; the passages are filled with fluid, and receive the termination of the special nerve of hearing. The internal ear is therefore the essential part of the organ (Fig. 19).

An abscess or "gathering" in the ear is an accumulation of matter in the drum. It is a very painful affection, at anyrate at first. It often leads to a perforation of the drum membrane, and when this occurs the pain either ceases altogether or is greatly relieved, and matter makes its appearance externally. Pain in the ear is often indicated by the child being restless, fretful, and putting its hand up to the side of its head. Abscess of the ear may lead to inflammation of the brain ; it is a condition therefore which should not be neglected. Pins and such like things should not be used for removing wax from the ear : they frequently injure the drum membrane.

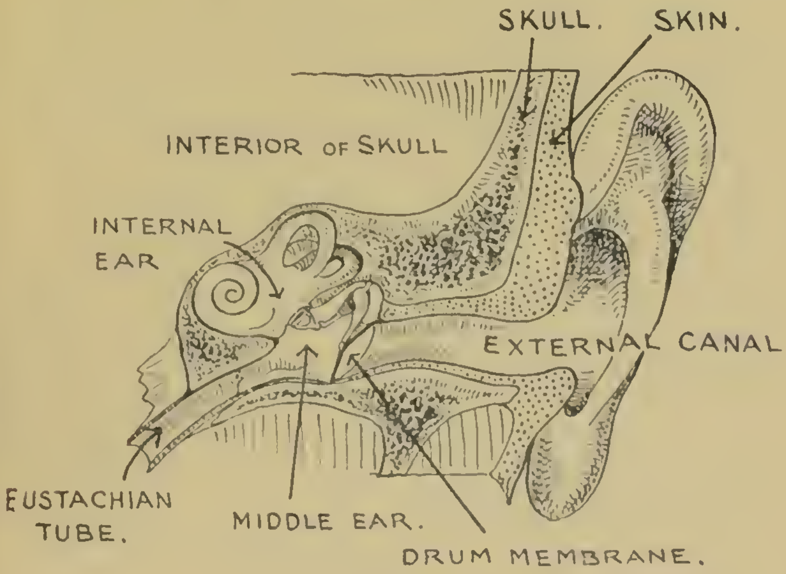

FIG. 19.

If the nurse has to syringe the ear, she may use a ball syringe such as is recommended for the nose (Fig. 18). An escape of blood-stained fluid from the ear, after an injury to the head, such as is produced by falling on the head, or a fall of coal or other heavy object, indicates fracture of the base of the skull (see *First Aid*).

Deafness is caused by many morbid conditions. The starting point of most cases is catarrh of the nose or throat. There is a tube leading from the top of the pharynx (just behind the nostril) into the middle ear, and it is along this tube that the inflammatory process, or discharge, the result of inflammation, travels to the middle ear.

It is a common and generally injurious practice to put oil into the ear to relieve deafness. The only time when oil should be inserted without medical advice is when an insect gets into the external canal. Beans and peas swell if allowed to remain in the ear ; they should be removed early.

Idiosyncrasy.—It is well to draw attention to the fact that people differ considerably in their response to medicines, and their power of digesting certain ordinary foods, and these peculiarities have to be duly considered in dealing with patients. Such articles of diet as milk, eggs, cheese, mutton, and various fruits, invariably disagree with certain people, and other foods must be found to take their place.

Other patients are unable to take certain drugs even in much smaller doses than are usually prescribed. It is not possible to account for all these idiosyncrasies, but the nurse should make herself acquainted with them if they are present in any patient under her care.

CARE OF CHILDREN

INFANTS differ from adults in several well-marked peculiarities.

1. Their small size.
2. Their helplessness; arising from the undeveloped condition of the brain, so that they cannot express themselves in intelligible speech; nor have they complete voluntary control over their muscles. The whole nervous system is very excitable.
3. The absence of teeth (until the seventh month).

It follows as a necessary result of these characteristics that the nursing of young children differs in many respects from the nursing of adults.

1. The size of the child. The surface bears a much larger proportion to the bulk or weight of the child than it does in persons of adult stature.

Let us compare two cubical blocks of wood, one of which (*a*) measures 1 inch in each direction, the other (*b*) measures 2 inches.

(*a*) has 6 square inches of surface.
(*b*) has 24 square inches.
(*a*) contains 1 cubic inch.
(*b*) contains 8 cubic inches.

So that in (*a*) the surface is to the volume as 6 to 1 = 6 times and in (*b*) as 24 to 8 = 3 times.

That is, in (*a*) the surface is twice as extensive relatively as it is in (*b*).

Heat is lost from the surface of our bodies and produced in the interior. It is clear then that in a child measuring half the weight of a man there is a greater surface for parting with heat. Hence, the necessity for warm clothing and for covering as far as possible the whole body.

How often does one see a well-clad mother holding in her arms a child with bare head, bare arms and legs, and afterwards expressing surprise that it has taken cold. A child is more susceptible to cold than an adult, because of this relatively greater extent of surface in contact with the air. Children are also much more readily influenced by warm and cold baths.

A child should increase in weight at the rate of one pound a month, from birth, until the end of the first year.

2. Its helplessness. A child cannot make its wants known except by crying, and a few significant signs, such as drawing up its legs, etc.

In consequence of its helpless condition it has to be
Clothed,
Fed,
Washed, and
Put to sleep.

The Child's Clothing.—The full consideration of this belongs to the science of hygiene. Here we are concerned only with clothing during sickness.

It should be completely enveloped in woollen from its neck to its feet. Undyed wool (Jægers') is the most suitable. There should not be anything encircling the chest which will compress it; the binder should not be used *at all* after the child is a fortnight old. A woollen jacket is more comfortable and equally useful.

Washing.—The skin must be kept clean. As it is easily irritated—being much more delicate than that of an adult—the choice of soap is important. Curd, Castile, or "superfatted soap" is the best. No soda must be used with the water in which its clothes are washed.

Washing should precede feeding.

The skin must be well dried.

Wet clothing must not be left in contact with the skin a moment longer than is unavoidable.

Feeding.—This is considered fully in *Food in Health and Disease* in this series.

Though milk is the natural food, it *sometimes* disagrees with a child, however it is modified. It should then have chicken or mutton broth, barley-water and egg-white water *for a day or two*, then the milk tried again.

Feeding-bottles *with long tubes* should not be used; the "Allenbury feeder" is the kind that should be used.

Sleep.—A young child should not sleep in the same bed with its parents or any grown-up person. It should lie in a cot, with open network sides. One side should be made to let down so that the child can readily be got at. A piece of netting may be stretched across the top if there is danger of the child climbing over the sides.

If a cradle is employed it must not have a canopy; or the head of the child must lie at the foot end, in order that it may get an abundant supply of air, and the cradle should be raised from the ground. When on the ground, the draught under the door is apt to chill the child, and is often laden with dust, which is very irritating to the child's chest.

The cradle, the feeding-bottle and the binder, are accountable for most of the sickness in young children.

3. *The Absence of Teeth at Birth* and for some months subsequently shows that only *liquid* food must be given, and continued until the teeth are sufficiently numerous to be of use for mastication.

When the teeth are cut late, for instance if the first only appear when the child is about a year old, it is suffering from *rickets*, a serious disease, and one for which medical advice should be immediately procured. The child generally sweats a good deal about the head *during sleep*, and the opening at the top of the skull is late in closing.

The Child's Cry.—This is the language by means of which it has to make known its wants.

It may indicate hunger, thirst, pain, internal or external.

If the legs are suddenly drawn up at the same time, it means flatulence ("wind"). This may often be relieved by gentle friction with the flat hand over the abdomen.

A sharp cry, suddenly cut short, caused by coughing means pleurisy.

A cry like that of some animal in distress, frequently repeated, along with stupor, means meningitis (brain fever).

If there are tears, there is as a rule nothing seriously wrong.

Uncomfortable clothing may be the cause of the child's distress.

4. *The Excitability and Immature Development of the Brain and Nervous System.*—Nervousness is well shown in its influence on the child's pulse, which is much quickened if the child be at all frightened or startled. A stranger has to gain its confidence by degrees.

This excitability is also shown in the recurrence of convulsion from apparently trivial causes.

Children are very susceptible to morbid influences, especially fevers. It is of the utmost importance to keep them, as far as possible, from infection, as each year a child lives, increases its chance of battling successfully against all forms of contagious influences. For instance, the younger the child, the more likely is diphtheria or measles to prove fatal.

FEEDING OF PATIENTS

The sitting posture should be maintained whilst taking food, whenever the patient is strong enough to sit or be propped up.

In cases of stupor and all conditions of great prostration, they must be lying down, sometimes with the head slightly raised, sometimes with it low, for as already stated, there may be danger in having the head raised.

A feeding-cup (Fig. 20) or a spoon must be used when the patient is fed lying down. The best kind is one with three handles, by which the patient as well as the nurse may take hold. Glass cups are the best.

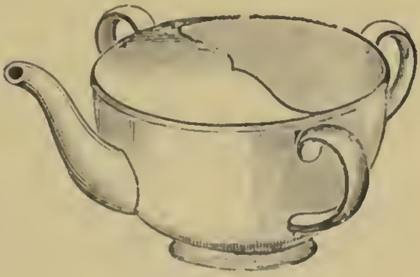
FIG. 20.

A tiny teapot may be used as a feeding-cup.

If the head cannot be raised at all a spoon or infant's feeding-bottle should be used.

When there is great difficulty in swallowing, a small spoon is best.

Clark's Food-warmer is a very useful apparatus for keeping the food warm at night. Though the patient only takes little at a time he may always want it *warm*, especially during the night, and it is often wanted in a hurry. Such an apparatus is therefore very useful. It is much more economical than keeping up a fire, which may not be required for any other purpose.

Rules as to Quantity.—Give little and often. It is better to bring the patient too little than too much. The sight of a large quantity of food may make him turn away in disgust.

Meals should be served neatly, the tray cloth and napkin must be spotless, the china attractive in design and quality. The nurse should be careful not to spill any of the liquid into the saucer.

The nurse must not taste the food in the patient's presence.

A cup or tumbler should be held by the bottom (not by the rim) when offering it to the patient. Her hands must be clean at the time; also her clothing (apron, etc.).

The Appropriate Diet depends upon

1. The nature of the illness,
2. The patient's idiosyncrasy.

1. The nature of the illness. It may be laid down as an almost invariable rule that, in all cases of *sudden* severe illness, and especially if there is fever, the diet must consist exclusively of *liquid* foods, and these must be of the most digestible kind.

In *chronic* disease, that is, disease which has lasted a long time, the diet has to be specially selected for each complaint, but has to be more nutritious than that required in an acute illness. In some chronic disorders (consumption for instance) as much food should be taken as can possibly be digested.

2. Idiosyncrasy has already been considered.

COMPOSITION AND USES OF FOODS

Foods consist of a great variety of substance differing in appearance and in chemical composition. Most foods consist of a part that can be used in the nourishment of the human body—mixed up with more or less "waste," or indigestible material. This latter is the most abundant in vegetable foods.

Milk is capable of being *entirely* digested and absorbed into the blood, but some vegetable substances contain about half their weight of non-nutritive materials. Disregarding these waste substances, all the nutritive materials can be grouped together under four heads.

Albumin, fat, starch, and sugar (in addition to salt and water).

Starch and sugar are practically the same *chemically*, and are classed together under the term *carbohydrate*, so that there are only three kinds of food material—albumin, fat and carbohydrate—and all *foods* consist of one of these or a mixture of two or all the three.

Albumin is best seen in the white of egg, but it also exists in all *flesh* meats, oats, wheat, barley, beans, peas, lentils, maize, milk, cheese.

Fat is found in both animal and vegetable foods; nuts contain a large amount.

Carbohydrate is practically only found in vegetable foods, and includes all forms of starch and sugar. Potatoes, rice, sago, arrowroot, cornflour, tapioca, are the principal varieties.

For health the body must be supplied with a certain amount of each of these three materials, for they serve different purposes. It is not necessary to go into a full consideration of this subject, but the nurse should certainly understand what foods contain these necessary materials, and the uses of them.

Two or three facts may easily be learned.

1. The actual essential *material* of the body can only be formed from albumin. This is therefore often spoken of as a "flesh-forming" food, as indeed it is. But it does more than this, it supplies a fair percentage of the body heat.
2. Most of the *heat* and *movements* of the body result from the consumption of fats and carbohydrates. These substances are not capable of building up the body. They are classed together as "heat-producers."
3. A mixed diet is most economical.

Gelatine (calf's-foot jelly, etc.) is a most useful food in acute illnesses from the fact that it is a heat-producer (acting like the carbohydrates), and serves to economise albuminous food, *i.e.*, much less albumin is necessary if gelatine be given at the same time, than if any other kind of food whatever is supplied in place of it. This is a most valuable property, for it is often to be observed during sickness that the flesh-forming foods are not well borne by the patient. The patient cannot take beef, mutton, peas, beans, bread or cheese or any other of the principal albumin-containing foods; he must therefore have a liberal supply of gelatine.

Foods have to be *digested*, that is they have to undergo very marked changes in appearance, solubility and chemical composition, before they can be absorbed into the blood. No substance can be considered a food unless it is capable of being thus acted upon by the digestive organs.

These changes are for the most part effected in stages, beginning at the mouth—being further acted on in the stomach, and undergoing the final and most important change in the small intestine.

The changes referred to are produced by (*a*) mastication and saliva in the mouth; (*b*) gastric juice and the stomach movement (a sort of churning) in the stomach; (*c*) intestinal juice, pancreatic juice and bile in the intestine.

Starch becomes changed into sugar. The unabsorbed indigestible portion (and a lot of digestible material also, if an excess of food be taken) is excreted from the bowel in the motions.

Solid foods tax the powers of the digestive organs more than liquid foods do. In many diseases the digestive juices are either absent or so feeble in digestive power that only small amounts of food, and that of the most digestible kind, can be absorbed. This is especially the case in fevers.

If the mouth is dry, no solid food should be given.

Of all foods milk is the most readily digested and the most completely absorbed, and it is specially remarkable for the fact that it contains all the three classes of nutritive material mixed in the proper proportion. This is obviously true, for most infants are (or ought to be) fed with milk alone during the whole period from birth until their first teeth are cut. Even milk in its natural state puts too great a tax upon the enfeebled digestive organs of some invalids; and thus it must be modified in some way, either by "predigestion," or by the addition of such substances as lime-water or barley-water.

Milk is predigested by mixture with Benger's Liquor Pancreaticus or Fairchild's Zynine powders, according to the directions supplied with each of these substances.

SPECIAL ARTICLES OF DIET FOR THE SICK

Beef Tea, mutton-broth, veal-broth, rabbit-broth, barley-water, wheys, lemonade, imperial drink and linseed tea are all extremely useful for the invalid. The nurse should know how to prepare each of them. Their preparation is described in the Appendix at the end of the volume.

One caution is necessary : people are under an erroneous impression with regard to the *nutritive value* of meat "extracts," such as Liebig's, Valentine's, and others of this class. They assume that in giving a patient expensive extract of meat, they are supplying him with a concentrated form of nutriment, calculated to "feed the patient." Now this is not so. Meat extracts are powerful and useful "stimulants" and aids to digestion, and may increase the patient's appetite for other food, but they are not nutritious, and they must not be relied upon alone for keeping up the patient's strength beyond a very limited time.

Plasmon is a highly nutritious and easily digested substance in the form of a powder, prepared from milk. It forms a useful addition to beef tea and broths.

Bread should be two days old and toasted.

Ice is useful to preserve foods in hot weather. It may be placed in a large basin around a cup or jug containing the food (milk, jelly, etc.).

The best way to break ice into small pieces is by means of a sharp-pointed pin.

Cooking.—Boiling and stewing are preferable to roasting for the invalid.

In grilling, the smaller the piece of meat the hotter the fire should be.

Under-cooked meat is more digestible than meat "well done."

Stimulants, such as brandy, whisky, gin, champagne, must be *prescribed* and *taken* (if used at all) in definite quantities and at regular stated times, like any other medicine, and the nurse must keep an exact record of the amount consumed. They must be administered by the nurse.

The nurse should be familiar with the three following facts with regard to alcohol in whatever form it is taken :—

1. It dilates the blood-vessels of the skin.
2. It lowers the body temperature.
3. It quickens the pulse.

ENEMAS OR ENEMATA

When food cannot be tolerated by the stomach in sufficient quantity to keep the patient alive, it must be introduced into the rectum (lower bowel) by means of an enema or ball-syringe.

A cleansing enema of simple warm water should be given first each morning. The nutrient enema is injected every two to four hours.

At first only 2 ozs. is used for an adult and correspondingly less for younger patients, the quantity being gradually increased to about 6 ozs.

The injected food should be warm.

The patient should lie on the left side with the hips elevated on pillows and the head low.

The injection should be made slowly, very slowly, in fact, or it will not be retained.

Care must be taken to see that the syringe does not contain air. A towel should be gently pressed against the part for a minute or two after withdrawing the nozzle of the syringe.

Suitable foods for injecting into the rectum are:—

Peptonised milk gruel.
Peptonised beef tea.
Benger's food.
A little brandy is sometimes added.

In obstinate constipation warm water with half an ounce or more of Epsom salts, makes a good enema.

A stimulating enema contains strong black coffee.

After serious hæmorrhage an injection of salt solution (two teaspoonfuls to the pint) is often extremely useful in reviving the patient.

The bed must, of course, always be protected by waterproof sheeting and a draw-sheet.

BED-MAKING

The bed should be kept as comfortable as possible.

Pillows require frequent turning: the patient may have to be gently held up whilst the pillow is taken away or replaced. When the patient is confined all the time to bed, he should lie first on one half, and then on the other. A helpless patient can be moved—

(*a*) By means of the draw-sheet; or

(*b*) He may have to be lifted, the upper portion of his body first, by placing one or both hands under his head and back of chest; then lifting the lower half of his body.

The under sheet and the portion of clothing underneath the patient should be kept smooth, to avoid sores.

The bed must be kept free from crumbs and moisture, and the sheets must be changed as often as necessary. The top and bottom sheet need changing at least once a week, and oftener if they become wet or soiled.

To Change the Lower Sheet.—1. "Gather up" the clean sheet (which of course has been thoroughly well aired) as far as the middle longways.

2. Turn the patient on his side so that he faces away from you.

3. Gather up the soiled sheet on the side of the bed next to you, *close* up to the patient's back.

4. Place the rolled portion of the clean sheet close to the roll of the soiled one, and spread the open half over the bed next you.

5. Turn the patient over the rolled sheets so that he faces you.

6. Go to the other side of the bed, remove the soiled

sheet, and spread out the clean one. The draw-sheet may be first placed in its proper position on the clean one, and placed on the bed along with it.

If the patient cannot be rolled on to his side, the clean sheet must be introduced crossways from the top of the bed. Gather up the whole of the clean sheet from the lower end; place the upper end under the pillows and gradually bring it under the patient, pushing the soiled one in front. Some one should assist the nurse when the latter plan is required.

To Change the Upper Sheet.—1. Introduce a warm blanket immediately above the sheet.

2. Turn down all the clothes above this blanket.

3. Spread the clean sheet over this blanket.

4. Replace the upper clothes, and leave them about twenty minutes to allow the clean sheet to acquire the temperature of the rest of the bed-clothes.

5. Draw out the soiled sheet and the blanket lying next it both together.

(*a*) If the nurse is alone, it is best to draw them *down* and take them from the foot of the bed.

(*b*) If she has help they can be quickly drawn away from one side, the assistant taking firm hold of and fixing the rest of the clothes at the opposite side of the bed.

Whenever the patient is able to sit up for a short time, advantage should be taken of this opportunity to *air the bed*, the clothes being spread out so as to allow air to circulate freely through them. If the clothes are neatly folded, they do not get aired. *Two beds* in a room are a great advantage when the patient is able to be moved from one to the other. Airing not only dries bed-clothes, but it destroys noxious vapours which always saturate any bed that has been long and continuously occupied.

WASHING PATIENTS

THE nurse has to wash young children, very old people, and those suffering from prostration, etc.

The washing must be done piecemeal and so as to avoid chill.

In fevers the whole surface should be sponged at least once every day. Begin with the face and hands, and then work towards the feet, taking care immediately each part has been well rubbed with a *warm* towel, to cover it up with the clothing.

A waterproof and blanket should be under the patient, and if two folded sheets are placed one close to each side of the patient underneath the waterproof, he will be in a hollow and can be thoroughly washed with plenty of water (if necessary) without any fear of wetting the bed.

Wrap the patient in a warm blanket for ten minutes before replacing his clothing.

To give a Foot Bath turn up the clothes from the foot, spread waterproof across the lower part of the bed, and put the foot bath on this. The knees are drawn up, the feet put in the tub, and the clothing tucked well around the thighs. After drying the feet wrap them in a warmed blanket. Patients should be washed when they feel at their best. They often sleep directly afterwards.

Baths.—Cold Bath: its chief use is to lower the temperature of the body. The longer he remains in, the more marked is the effect produced.

The water should be about 75°, and must be ascertained by means of a "bath thermometer," and not guessed by the hand.

For delicate people and children it is best to have the water warm to commence with, and gradually to lower the temperature, after the patient gets into it, by the frequent addition of cold water, until the whole mass falls to the required temperature. If the patient's temperature is very high, and he cannot be placed in a bath, the surface must be sponged with cold water.

Sometimes a cold bath will save a patient's life when nothing else will.

Hot Bath. — Begin with water at 102°, and add hotter water, stirring all the time.

A hot bath dilates the blood-vessels of the skin and causes copious perspiration. It is seldom necessary to exceed 105°. The attendant must remain with the patient, for there is always a risk of *fainting*.

On leaving the bath the patient should be immediately enveloped in plenty of *hot* dry towels, and he should remain in an arm-chair or on a couch until quite dry. This takes from twenty to sixty minutes.

They are useful in congestion of the kidneys, after scarlet fever and in rheumatic affections, etc.

The only bath a nurse should give on her own responsibility is a *warm bath*, with water at a temperature of 100°. This she may safely give to a child whom she thinks threatened with convulsions.

A bath should not be given near meal times: the best time is 10.30 to 11 a.m.

If exhausted after the bath, the patient should have some hot broth or milk.

Blanket Bath or "Wet Pack."—A blanket wrung out of cold water, and in which the patient is wrapped (naked), may be used instead of a cold bath or cold sponging to reduce the temperature in fever. If hot water is used it will cause free perspiration.

First place a large sheet of waterproofing on the bed; over this spread a dry blanket. The patient enveloped in the wet blanket is placed on the dry one, which is then folded around him.

The wet blanket should be tucked in between the patient's legs, and also between his body and arms, so as to bring it into contact with the whole surface. The wet blanket must be replaced by another similarly wet at frequent intervals.

DRESSING PATIENTS

In putting on clothing when there is any injury, begin on the injured side: in removing clothing begin on the sound side.

Jackets are best put on so as to fasten behind.

Two sleeping gowns should be in use, one for the day, the other for the night.

To change the night-dress and under-vest, they are loosened at the wrists and brought well up under one shoulder, the arm is taken out, and the corresponding clean sleeves are put on, and both sets of garments—the soiled ones first—slipped over the head. The soiled things are then easily removed, and the clean ones put on the other arm.

When an arm is injured, the sleeve can be open on the outer side throughout its whole length, and fastened with tapes at intervals of a few inches.

LIFTING PATIENTS

1. The methods described in *First Aid* may be adopted whenever suitable.

2. To move from one bed to another of the same height: Bring the two beds together at the sides; remove the clothing from the spare bed, and then draw the patient on to it by means of the under sheet.

3. To carry from one bed to another, or to a couch: Bring the patient's head and upper portion of his body over one side of the bed: two bearers then stand one on each side of his head, and place one hand and arm under his shoulders, and the other under the hips. A third bearer may support the legs.

A stout blanket and sheet may first of all be placed beneath him and he can be carried—by simply holding to them, having made them meet over the patient's body, or each edge of the sheet and blanket may be tightly rolled round a stout pole or broom-handle, thus forming a kind of stretcher.

ADMINISTRATION OF REMEDIES

Medicines.—The label should invariably be read just before pouring a dose out of a bottle.

Liniments and lotions should be kept apart from medicines for internal use.

Every dose must be *measured* and not guessed.

The patient should not be allowed to drink out of the bottle.

A "tablespoonful" means half an ounce, which is much less than many tablespoons will hold.

A teaspoonful is one-fourth of a tablespoonful.

All medicines should be out of reach of children.

The mantelpiece is not the proper place for medicines if there is a fire in the grate; the heat may decompose the mixture.

Powders must not be given to a patient who is unconscious.

Strong purgatives, and those which act quickly, are best given early in the day, so that the patient may not be disturbed during the night.

Slow-acting aperients (laxatives) may be given at bed-time.

Castor oil and cod-liver oil may have their taste disguised by letting them float on orange or lemon juice or light wine.

All medicines should be taken *after* food, unless specially directed to be taken before.

"Three times a day" medicines are best taken about 10 a.m. and 2 and 6 p.m.

"Every four hours" medicines at the same times, and also at 10 p.m.

The mouth should be well washed out after all medicines having an inky or sour taste (such as iron and acids).

Some drugs (iron, bismuth) render the motions very dark.

Poultices.—The uses of poultices are:—

1. To relieve pain.
2. To hasten abscess formation.
3. To get rid of offensive discharge.
4. To produce slight "counter-irritation."

The substances used are: linseed, bread, charcoal, mustard, hot and cold water.

A Linseed Poultice is made of linseed meal and hot water, as follows:—

Get a small clean basin; heat it with hot water. Then place in it *boiling* water sufficient for the poultice. Sprinkle the meal into the water, stirring constantly with the handle of a tablespoon until the whole is like a mass of porridge.

Spread this mass on a piece of stout flannel 2 inches larger than the poultice is to be made, and fold the edges over the margin of the poultice all round.

It must not be too thick or it will feel heavy: if too thin it will cool too quickly.

Lint, cotton wool or tow may be used instead of flannel.

If it has to be carried from one room to another it can be kept hot by placing it between two hot plates.

Before applying it to the patient the nurse must test the heat: it must not be too hot or it will scald the skin, and may cause severe blistering.

How to test a poultice: the nurse should hold it *in contact* with her own cheek or elbow for a moment; if she can bear its contact in either of these situations, it is not too hot.

In placing it on the skin, put one edge down first, and gradually lower the rest of it. Then cover it up with more flannel or cotton wool in order that the heat may be retained as long as possible.

A fresh poultice should be applied every two hours during the day, and every four hours at night.

Special care is necessary in applying a poultice to a child in order

(*a*) Not to frighten it.
(*b*) Not to scald it.

A Charcoal Poultice is made exactly the same as a linseed poultice, with the addition of a little powdered charcoal. It may either be mixed with the meal, or sprinkled over the surface of the spread poultice.

It serves to keep down offensive odour.

Mustard Poultice.—Mix one part of mustard to two or three of linseed meal or flour. Mix it into a paste with cold or warm (not hot) water, and spread on lint or brown paper, then cover the surface with muslin. From fifteen to thirty minutes is as long as it can be borne. It should be removed when the skin has become distinctly reddened by it.

A mustard poultice must never be applied

(*a*) To a young child,
(*b*) To anyone just recovering from fever, or
(*c*) At a time when the patient is likely to fall asleep, for if left on too long severe inflammation, even mortification of the skin, may be produced.

Removal of Poultices.—After removing a linseed poultice apply warm olive or sweet oil to the skin, and cover up with wool or flannel to keep it warm.

After removing a mustard poultice the surface should be wiped and then covered with a piece of linen soaked in oil.

The triangular bandage is to be applied as directed in *First Aid* for the purpose of keeping a poultice in position.

A Bread Poultice may be used for contusions of the fingers. It is made like a linseed poultice, except that bread crumb is the material employed. It should be made in a muslin bag, and the superfluous water squeezed out just before applying it.

Fomentation.—This is the application, to the skin, of flannel wrung out of hot water, alone or with the addition of turpentine or laudanum.

It acts like a poultice, is more cleanly, more readily applied, and more economical, but it does not keep hot so long.

Preparation.—Take a piece of flannel large enough, when doubled, to cover the affected part; put it in the middle of a "wringer," a stout roller towel, or a piece of towelling a yard long; pour boiling water over it and soak it thoroughly. The ends of the towelling are now to be twisted (by two people) in opposite directions, so as to squeeze the flannel as dry as possible. It is then applied to the skin and covered with a piece of oil-silk or other waterproof material, to retain the moisture, and a thick layer of wadding to retain the heat.

A "turpentine stupe" is prepared and applied precisely like an ordinary fomentation, with the addition of a teaspoonful of turpentine sprinkled over the surface of the flannel after taking it out of the wringer.

Fomentations should be renewed every twenty minutes, the fresh one being ready for application as the other is taken off. They are specially useful for application to the abdomen.

Dry Heat.—A flannel bag filled with hot salt or hot bran is useful as an application to bruises and sprains.

Blisters.—Many substances are occasionally used to produce a blister, but the most satisfactory is the one called cantharides or "Spanish Fly" (a kind of beetle).

Two preparations are used, the plaster and the liquid.

The surgeon or physician in attendance will say *where* the blister is to be applied.

Four to six hours is the usual time it has to remain on; but the nurse should gently turn up the edge to see if the epidermis has risen up. If so, the blister should be removed; if not, it can remain an hour or two longer. The blister on the skin should not be broken in removing the plaster, but it may be pricked with a clean needle in order to allow the water to escape. This water must be dried up, and not allowed to run over the surrounding skin, or it may produce further blistering.

Cover the surface with a piece of linen smeared over with vaseline.

The patient should drink freely of water, or barley-water, whilst the blister is rising.

Ointment is used for

(*a*) Its local action, as the healing of an ulcer; or

(*b*) Its constitutional effect, in place of medicine by the mouth.

Iodine ointment stains calico and linen black. The part should be covered with flannel.

Mercurial ointment is used for young children. It is spread on the binder which envelops the abdomen.

Ointment should be spread on the *plain* not on the fluffy surface of lint.

Carbolic, *boracic* and other "antiseptic" ointments are used for wounds.

Leeches are used to withdraw blood. A leech is a dark-coloured worm- or snail-like animal. The narrower pointed end is the head. There are two suckers, one at the head and one at the tail end, by means of which it attaches itself to objects.

The mouth is provided with three saw-like teeth, which penetrate the skin very rapidly. A small three-rayed scar remains after the wound is healed. They are employed to relieve an inflammation in the very early stage. Each leech will extract from one to two teaspoonfuls of blood. A couple will be sufficient behind the ear for inflammation about the ear or eye: six or eight will be required for the knee or other large part.

Application.—Wash the skin where the leech is wanted to bite, and dry it thoroughly. Hold the leech gently inside a cloth so that the head end projects, and continue applying the head to the skin until it holds.

If there is much difficulty, a tiny drop of milk may be placed on the spot.

Special "leech tubes" can be procured.

After the leech is full it generally drops off, and it can readily be made to do so by sprinkling a few grains of salt on its body.

Caution.—Care must be taken to see that the leech does not get inside the body of the patient; if by any chance such a thing should occur, salt solution must be injected. If the leech has passed into the stomach, the patient must drink a tablespoonful of salt in water to produce vomiting.

If the wound continues to bleed too freely, it should be well washed with warm water. Then place a small hard pad on it, and secure by a firm bandage.

Inhalations are drugs applied in the form of vapour to the air passages.

The drug is mixed with hot water in a jug or special inhaler, and the vapour inhaled (Fig. 21). Care must be taken not to draw the hot water into the mouth.

If the drug is to be inhaled cold, it is best to use a spray producer, the best form of which is called an "atomiser."

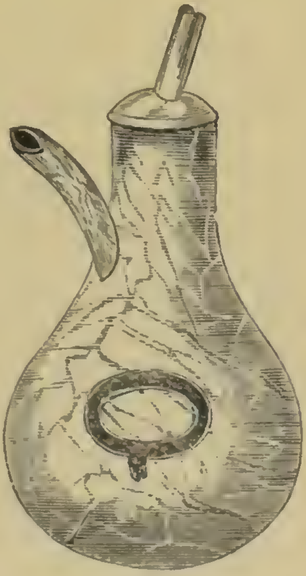

FIG. 21.

Friar's Balsam, carbolic acid, creosote, eucalyptus, and other antiseptic substances, are what are chiefly used.

Another way to inhale them is by saturating the air of the room by means of a bronchitis kettle (see p. 47).

PADDING SPLINTS

In "rendering first aid" in cases of fracture the splints are often necessarily of a rough and ready kind.

Afterwards when the case is attended to by a nurse, the splints must be carefully padded in such a manner that, when applied, they will exert a uniform pressure throughout their whole length.

Sheet wadding and tow make good padding; it should form a layer of equal thickness and project an inch beyond the edges and ends of the splint; the whole is next surrounded with calico or linen, and secured by needle and thread, or two or three strips of adhesive plaster.

The cover must be renewed as often as it becomes soiled.

Bed Cradles are frequently needed to keep the bedclothes from pressing on the painful part. Three half-hoops—such as are placed round small barrels—can be fastened together about 6 or 8 inches apart, by means of sticks passing across each of them tied by string or bandage.

Three sides of a small grocer's box (without top and bottom) answers well for the leg.

The clothes can be held up by means of a corkscrew passed through them from the outside (about the middle of the bed) and secured to a cork under the top sheet. The handle of the corkscrew is then fastened to a stout cord, passing from the top of the head to the top of the foot of the bedstead.

PERSONAL AND FAMILY HYGIENE

The consideration of this subject belongs to the science of hygiene, and the reader must be referred to manuals on that subject.

It is only necessary here to draw attention to the importance of observing the same hygienic laws in sickness that are found by experience to be essential in the maintenance of health; the house, drains and soil pipe must be in a sanitary condition; good wholesome food, suitable clothing, cleanliness, and tranquillity of mind are all necessary, and as soon as the patient is able to be about appropriate exercise must be taken.

PREPARATION FOR AN OPERATION

Whenever any operation is to be performed, especially if it is one likely to keep the patient confined to bed for some length of time, the room must be prepared almost as for a fever case, according to the directions already given, especially as regards the bed, furniture and cleanliness.

MANAGEMENT OF CONVALESCENTS

The great aim is to *gradually* accustom the patient to those foods, exercises and recreations which he enjoyed before his illness, so far as they are considered suitable. Any previous fault in his mode of living should be remedied—or at least the remedy should be attempted. Solid foods must be commenced with caution after a patient has had a long course of liquid diet: white fish, breast of chicken, tripe, oysters, poached eggs and light milk puddings are the best to begin with—and the ordinary diet must not be fully resumed until it has been found that the things just named are well tolerated. Let there be as much variety as possible, and the patient's likes and dislikes must have due consideration.

The patient must take as much exercise as possible, without being fatigued.

He must have plenty of sleep and not be allowed to return to his business too soon. Change of air and scene is extremely beneficial to most convalescents.

If walking is out of the question, he should drive or go in a bath-chair.

PREPARATION FOR THE DOCTOR'S VISIT

The nurse should have everything under her charge in readiness for the doctor's visit: hot and cold water, soap, towels, temperature record, etc.

VISITORS

Some patients are benefited by seeing their friends, and so long as the visitors do not worry or fatigue the patient, there is no need to lay down any stringent rules with regard to them.

When the patient is very feeble, or suffering from an infectious disorder, visits of friends and relatives must be restricted to what are absolutely necessary. In infectious cases, no one should see the patient except those who are actually engaged in the nursing.

Many people do not realise, or are forgetful of the fact, that though they may not "catch" the infection themselves, they may be the means of conveying it to others.

Visitors should see the patient when he is at his best: he should be told of their visit and they should be admitted directly after their arrival has been announced.

The visitor must be told how long he may stay, and such time should not be exceeded; in fact it must be curtailed if the nurse notice signs of fatigue or undue excitement in the patient. Visitors should not prolong leave-taking.

While in the room they should sit or stand where the patient can see and hear them with the least effort on his part.

The nurse must carefully note the after effect of the visit: if it is bad the visit is not to be repeated.

Visitors should not be admitted late in the day, nor just before meal-time.

Visitors to an infectious case should not sit down, or touch any of the bedding or furniture, and they should give their clothes a good shaking on getting into the fresh air. They must not eat or drink in the sick-room.

If a patient is seriously ill nothing must be said in his presence calculated to depress him.

A favourite subject of conversation is the experience of similar cases of illness, and some take delight in recounting those that have proved fatal. This is a mistake, and the nurse should interpose to change the subject.

THE NURSE

Every woman should endeavour to learn something about the science and art of nursing, in order to be able to do duty at home whenever called upon. It is impossible to tell when the occasion may arise; very often it comes quite unexpectedly.

Nursing is required in every station of life, for disease spares no one.

The groundwork of the science and art of nursing should be learnt whilst the girl is still at school. Educational authorities are awaking to this important fact, and in many schools facilities are now offered for learning what is called "Domestic Economy and Hygiene," a knowledge of which is essential to nurses of all kinds, whether in the "Hospital," the "District," or the "Home."

A professional certificated nurse has to undergo some *years* of training, but a good deal of useful information can be acquired without going into any training institution, by reading at home, and by attendance upon "Evening Continuation Classes," given now in connection with many elementary schools throughout the country. In some places the subject can be pursued further by attending "Day Continuation Classes."

The mother, wife, sister, daughter, or friend may be never so willing and anxious to nurse the sick, and yet, for want of sufficient knowledge, may not only do little good, but even positive harm.

A good deal has been written about the character, mental, moral and physical, of the trained nurse, and all these points must be carefully considered in any woman who proposes to take up nursing as a profession.

With regard to *the untrained nurse* (the woman who only wishes to help when occasion arises in her own home or family), these points are often out of consideration, for we "must take them as we find them," and yet, whether the nurse be "trained" or "untrained," the same duties have to be performed, and therefore the same qualities and capabilities are *required* in both if the best is to be done for the patient's welfare.

This being so, I think it best to point out what is required in a trained nurse. What the non-trained nurse has to aim at is to approach this standard as nearly as her opportunities render possible.

Qualities of a Nurse.—1. Physical qualities. She should be strong and healthy. It is of no use whatever for a delicate, frail young woman to expect to succeed as a professional nurse, for any attempt on her part is certain to end in failure.

Nursing is a healthy occupation, but it is arduous, sometimes taxing the nurse's powers to their utmost, and sometimes the strongest has to "give in." There is no question of the "eight hours day" for her, and she has to work seven days in the week. There must be no physical defect which may interfere with her work. She should be strong in arm and leg. There should be no varicose veins or "flat foot."

Her face should be such as a patient will like to look at, and if the features are not beautiful, the expression should compensate for any such defect. A cheerful face is sometimes more helpful than a dose of physic.

Before commencing a course of training she should undergo a medical examination, and any remediable defects should be cured. For instance, she may be suffering from some slight nasal obstruction which produces *snoring*. A snoring nurse will disturb her patient's rest if they both sleep in the same room.

A study of the preceding pages will convince the nurse that there is often a good deal to do for the patient; washing, feeding, dressing; bed-making, changing of sheets; keeping the room scrupulously clean; cleansing utensils, making poultices, beef tea, etc.; taking temperature, pulse and respiration records and attention to her own personal health, involve a considerable amount of *work*.

2. *Mental Qualities.*—A nurse should have more than average intelligence. There is little room now for Mrs Gamp.

Nursing has recently made great advances, largely, if not indeed chiefly, owing to the intelligence, devotion and writings of Florence Nightingale, together with improved methods of treatment and the knowledge of disease.

The nurse's "five senses" must be well-trained, and she must possess "common sense" in an uncommon degree.

3. *Moral Qualities.*—These should be of the highest order. She must be pure, trustworthy in every respect, and do everything with a single eye to the patient's good.

She must co-operate with the doctor in bringing about the patient's recovery, and if this is impossible, soothe him to the best of her ability.

She must uphold the doctor's authority; must abstain from foolish gossip, and must not divulge secrets.

Her patience must be inexhaustible; her manner quiet, dignified and not fussy, but quietness must not be carried to an extreme.

Her Duties.—"On first going into a house, the duty of the nurse is to find out where everything that will be needed is kept, then to wait on herself quietly, and without intruding."

She has full control of the patient and the sick room.

She must give as little trouble as possible to the family, and must not run them into unnecessary expense. She must not make the servants wait upon her, or do anything for the patient, more than necessary. She ought to be accustomed to reading aloud, for in this way she may often succeed in lulling to sleep a restless patient, which in the end may prove a great saving of trouble.

She should read good and instructive books. A very able lady writer, herself a nurse, says: "she should, if possible, attend the theatre twice a month."

The rest of her duties are summarised on p. 107.

The nurse's duties, to be properly performed, imply competence, punctuality and obedience.

A nurse should carry a *note-book* in which to jot down the doctor's orders at once, lest they escape her memory.

Night Duty.—When doing night duty, she should begin early in the evening to prepare for the night, so that she will not need to go hunting about for things after the family have retired to rest.

Etiquette.—"On the entrance of the medical attendant," writes a lady nurse, "the nurse should rise, hand him her report, answer questions, then quietly leave the room, unless she knows she will be required. This allows matters to be discussed that the patient may not want the nurse to hear. It also allows her an opportunity of telling the doctor, on leaving, anything she does not want the patient to hear. She should leave the room when a visitor comes, and when the *limited* time is up she should return and inform the visitor."

On going off duty she should leave written instructions for her substitute.

The Nurse's Dress.—Her skirt should be short, so that it does not touch the ground. The whole dress should be of a light colour. (Black dresses are an abomination, and have a most depressing effect on patients.)

It must be made of washable material, and be as plain as possible. It should be *very* slightly starched, so that no rustling noise is heard as the nurse moves about.

The same kind should be used in all seasons; extra underclothing being used in cold weather.

Her cap is her "badge of authority."

She must not wear noisy boots or shoes, and yet must not move about on tip-toe, so as not to be heard at all.

A chatelaine should not be worn or any jingling ornaments.

"Her appearance at all times must be as though she had just come out of a bandbox."

Nurse's Personal Hygiene.—If the nurse is not well herself, she cannot properly do her duty to her patient; she must therefore endeavour to keep in the best of health.

She *must* spend some time in the open air every day, whatever the nature of the illness or state of the weather. She should walk for at least half-an-hour.

Her bedroom should be well ventilated, and in any serious case should not be far from the patient's, in order to be within call in any emergency.

She must sleep at a time when she can best be relieved by some other member of the family.

When on night duty, she must be well supplied with warm clothing and extra wraps, and should have warm food at 2 o'clock in the morning (tea or coffee, etc.) and at other times as she may feel the need for it.

Her hands, fingers especially, must be scrupulously clean, with the nails cut close.

Before beginning to dress a wound she should wash her hands and dip them in 1 to 80 carbolic, and repeat the process *after* the dressing is done.

Soiled dressing should not be touched by the hand, if possible to avoid it. "Dressing forceps" should be used for this purpose.

Meals should not be taken in the sick room, except in case of absolute necessity. She should have an agreeable change of scene at meal times. Her meals should be taken alone, unless the family really wishes her presence at their table.

A daily bath should be taken.

The hair should be smooth and well kept.

THE ROLLER BANDAGE

A good deal of practice is required to apply a roller bandage properly, and to acquire the necessary skill the pupil must *see* it applied by the surgeon or other qualified teacher.

The width varies according to the part to be bandaged, as follows :—

About an inch for the finger, two inches for the arm and head, three for the leg, four for the thigh or chest.

There are three objects to achieve in its application.

1. To cover the whole surface of the limb or other region.
2. To make the bandage press equally by *both* edges and throughout its whole extent.
3. To get the requisite amount of pressure—
   - (*a*) If it is too tight it will obstruct the circulation.
   - (*b*) If too slack it will work loose and slip down.

If the bandage is rolled round any limb which thickens nearer the body, and simply taken round and round and the whole surface covered, it will be found that only the *upper* edge is exerting pressure and the lower edge stands up loose.

On the other hand if both edges are made to press *equally*, and the bandage is still simply taken round and round, there will come a point when it will run too high up the limb, so that a portion of the surface is left uncovered, as shown in Fig. 22.

This difficulty is got over by a very simple device which consists in "*reversing*" the bandage. Theoretically it is simple enough, but it is not *easy* to do without practice.

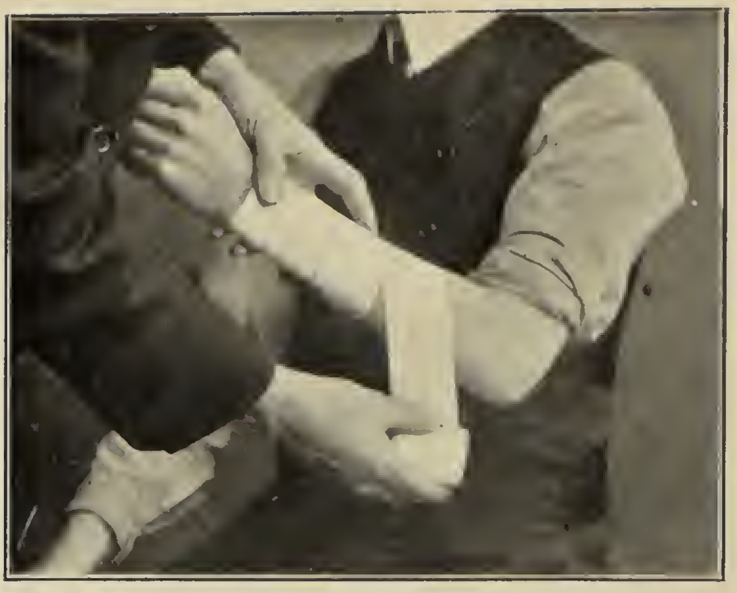

FIG. 22.

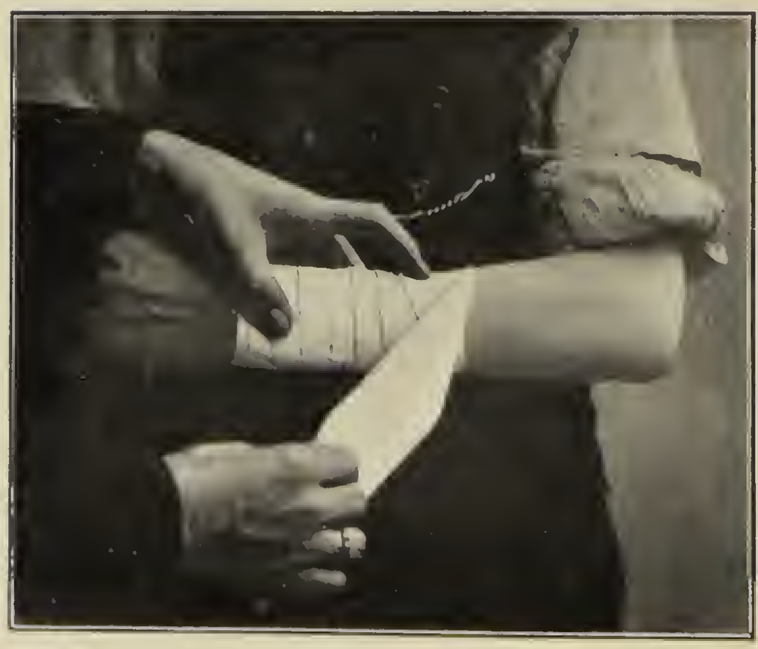

FIG. 23.

When the time comes for the reverse—and as a rule, after one turn has been reversed, most if not all of the succeeding ones will require reversing—the forefinger of the left hand is pressed firmly on the bandage so as to fix it; then the part between this point and the roll is to be made *quite slack*; it is then turned over (reversed) so as to bring the under side

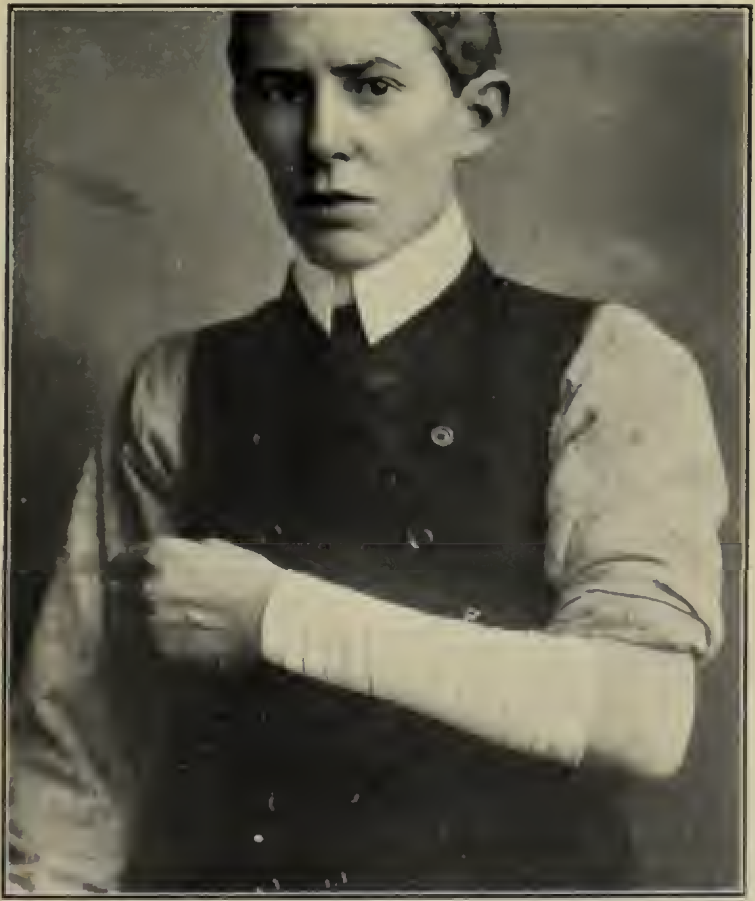

FIG. 24.

uppermost and the top edge to the bottom (Fig. 23). It must not be *pulled* over, but simply allowed to *fall.*

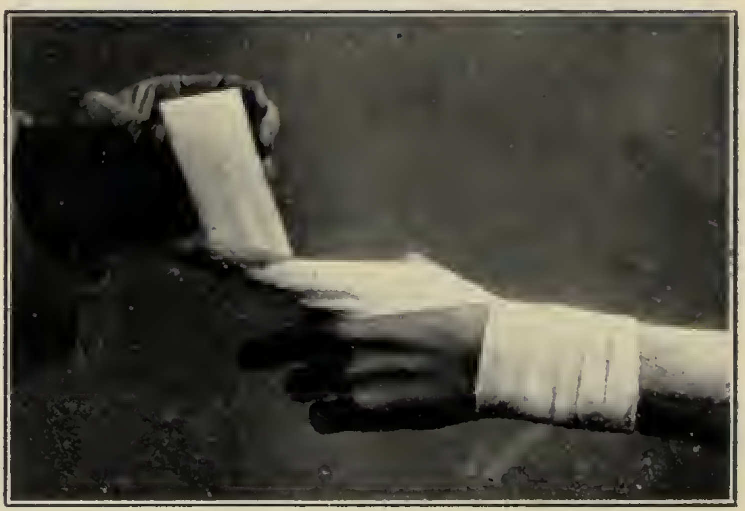

FIG. 25.

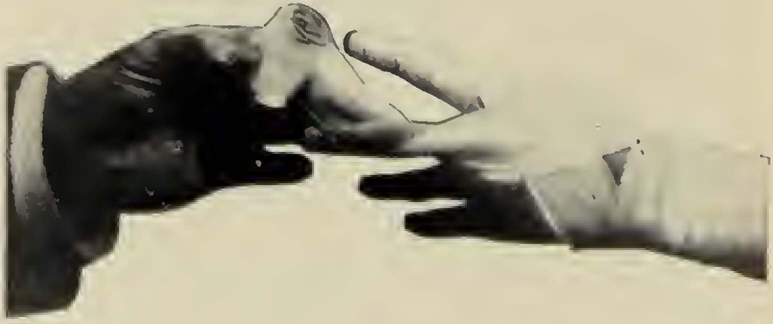

FIG. 26.

This is *the* difficulty in applying the roller: the student should therefore attempt to master it at the outset (note specially the words in italics in the last paragraph).

It will be noticed that the reverse is *always* made backwards towards the narrow part of the limb: in the upper limb it is turned towards the hand and in the lower towards the foot.

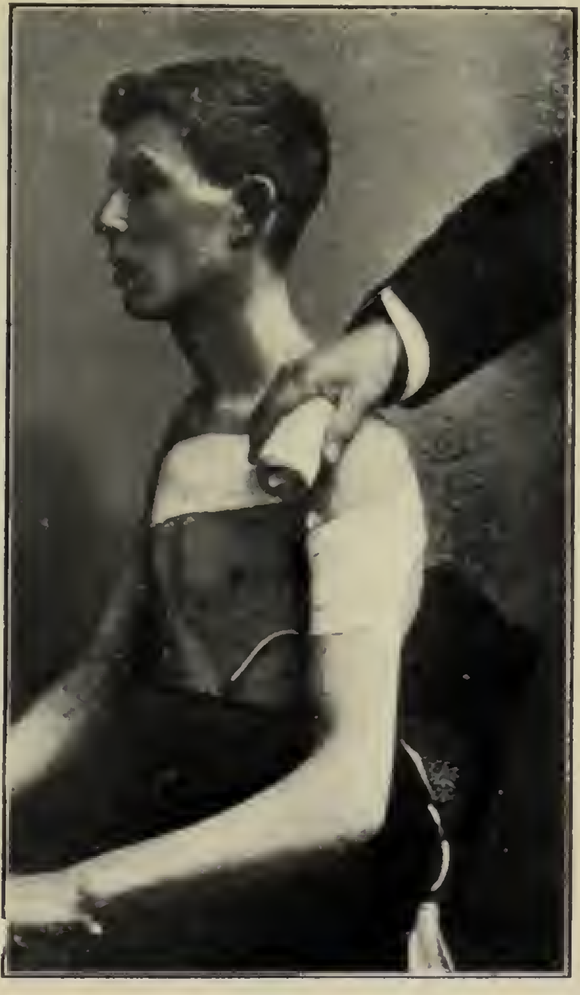

FIG. 27.

After the reverse, the bandage is carried round, and the next turn reversed in a similar manner. The result in the arm is shown in Fig. 24.

If the reverse is made at exactly the corresponding point in each turn, the result looks *neat.*

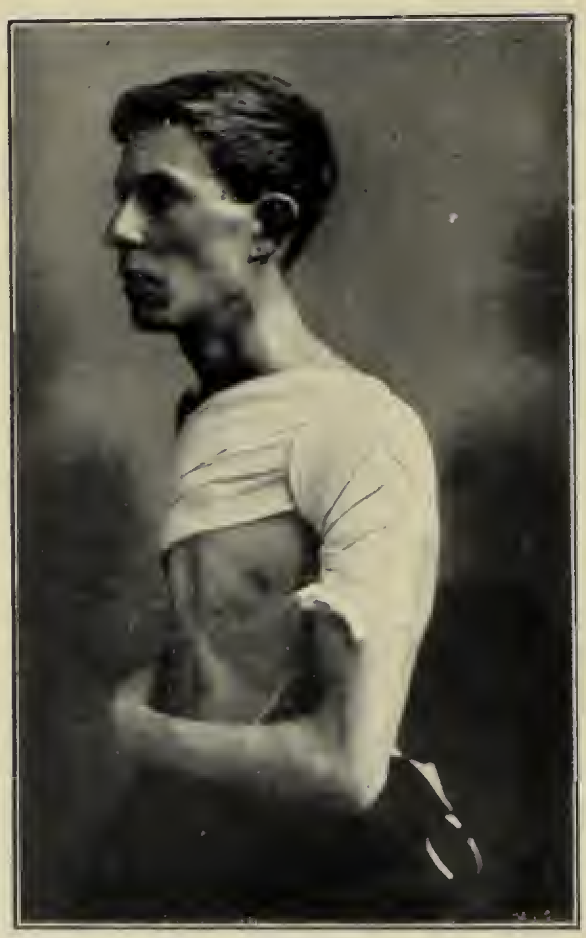

FIG. 28.

In bandaging the forearm begin at the wrist, in the leg begin at the ankle. If it is carried to the upper arm, bend the elbow to a right angle—in order that it may be carried in a sling—*before* any part of the bandage is applied above the elbow.

Fingers.—To make the bandage secure, it should be taken first a few times round the wrist, brought across the *back* of the hand to the finger, and after this is covered, it should be

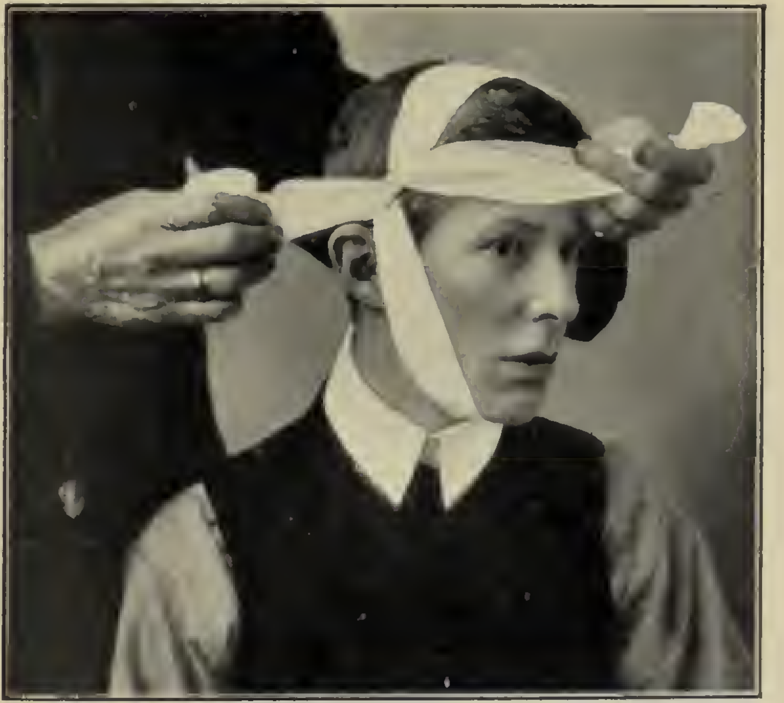

FIG. 29.

taken again across the *back* of the hand to the wrist and finished off there (Figs. 25 and 26).

To bandage two fingers (or more) proceed as above, first with one finger, then after taking a turn round the wrist come back in the same way to the second finger, and so on.

The Figure of Eight bandage consists in applying it in turns alternately above and below a joint. For instance at the elbow, one turn will pass round the forearm (quite *near* the elbow), the next will go round the upper arm, the third one again round the forearm and so on.

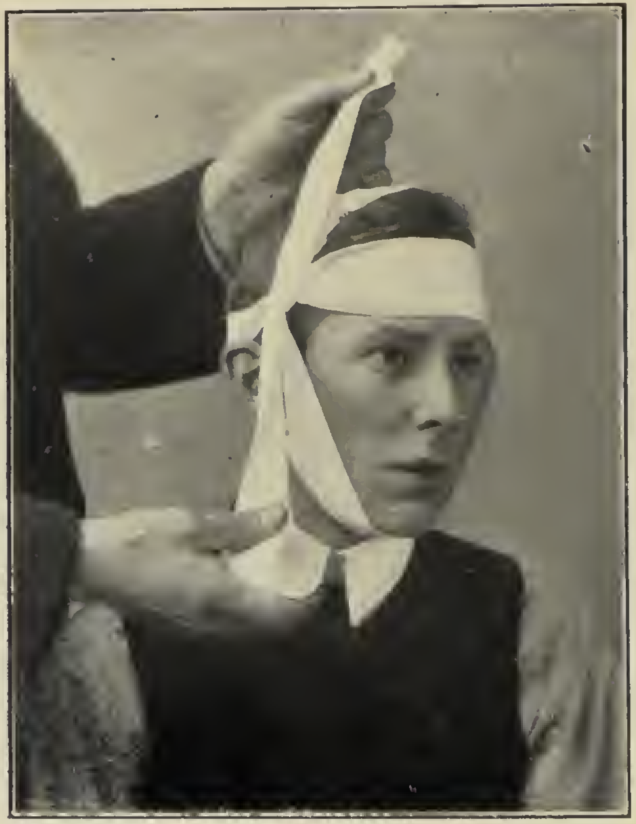

Fig. 30.

This mode of application is used especially about the knee, ankle and elbow.

A *spica* bandage is somewhat similar to a figure of eight, and is applied round the limb (arm or leg) at its junction with the trunk. One turn of the bandage goes round the upper arm or thigh, the next goes round the chest or abdomen, the third round the limb again, and so on, until the whole part is covered and the desired amount of pressure produced (Figs. 27 and 28).

Roller Bandage for the Head.—Take a turn round the head vertically and when the bandage meets at the temple give one

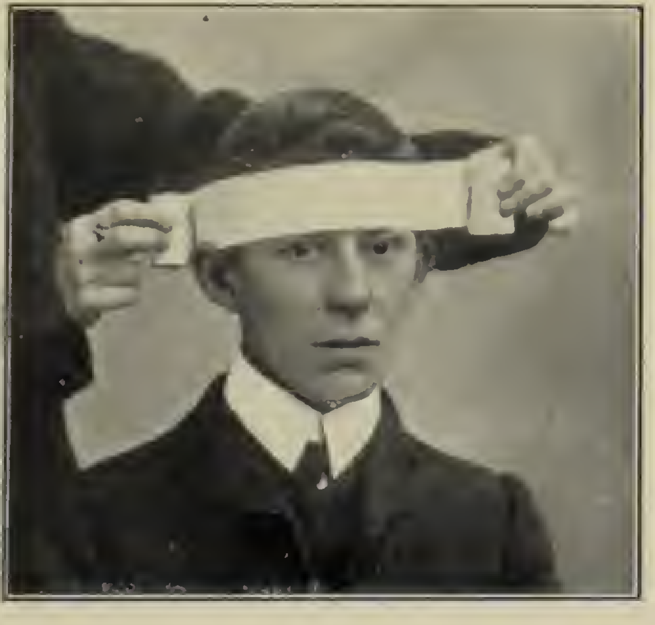

FIG. 31.

portion half a turn round the other, so that the direction is changed to the horizontal (Fig. 29), and bring the *roll* right round again to the *same* temple, giving another half turn with it round the short end (Fig. 30). This can be continued as often as necessary to secure the pressure required, the short end (shown in the figures held in the left hand) serving all the time as a fixed point to secure the various turns. The two ends are then tied together near the *opposite* temple where the crossed portions should be pinned or stitched. This is a most useful bandage, and is the best for arresting hæmorrhage.

The Roll-r-Capelline Bandage is more difficult of application. Take *two* roller bandages, place them side by side so that the end of one is directed towards the end of the other. Fasten those two ends together.

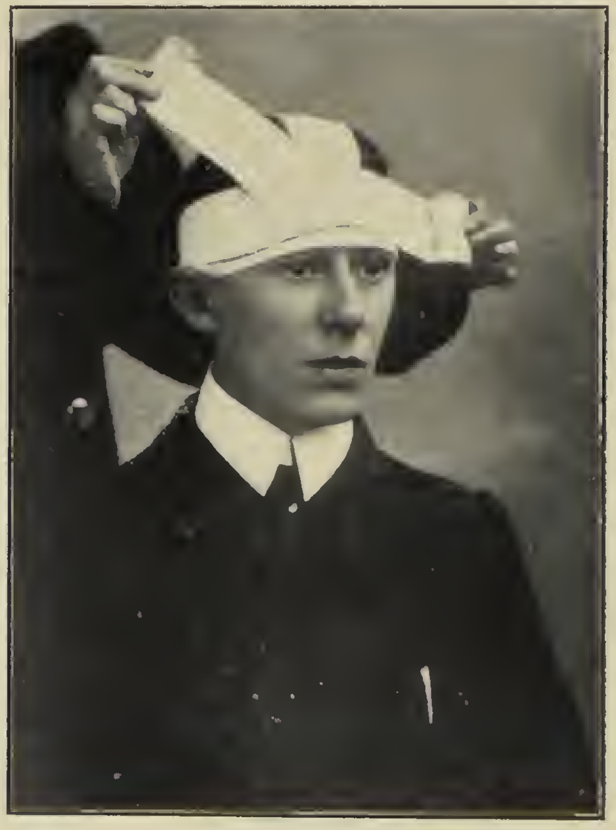

Fig. 32.

Stand behind the patient, place the joined ends against the forehead of the patient, low down, and bring the two rolls, one round the right side, the other round the left side, to the back (Fig. 31). Let one pass below the other, *i.e.*, nearer the neck, and whilst holding the upper one firmly, turn the lower one upwards and take it across the top of the head to the forehead and as low as the bridge of the nose. Whilst holding

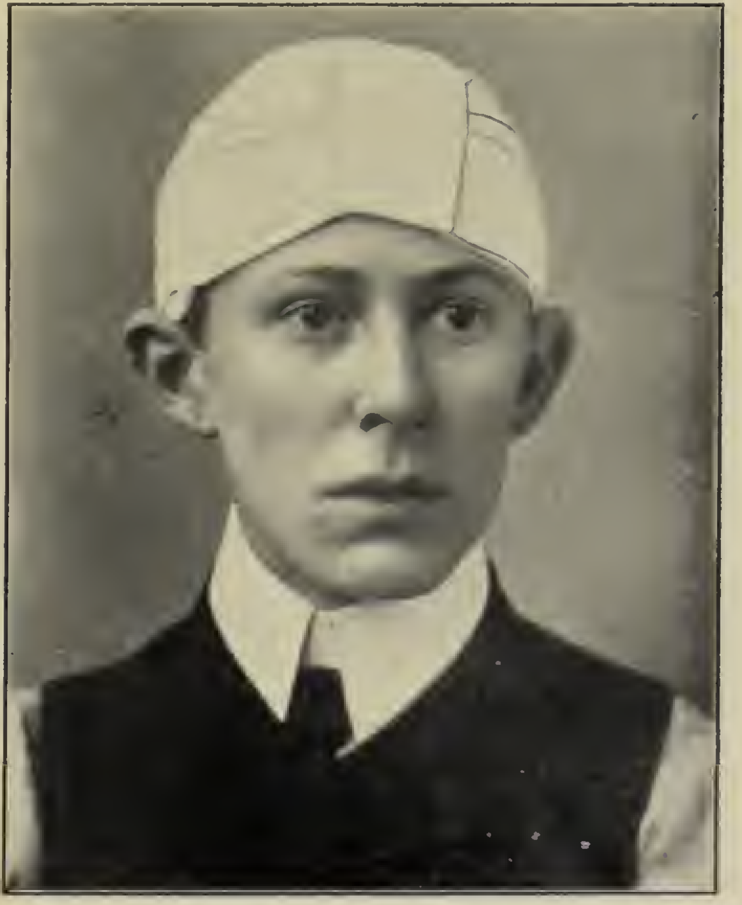

Fig. 33.

it in this position, bring the other roller also horizontally round to the front, and let it cross the one pointing downwards. This latter is then taken over the horizontal turn (Fig. 32), across the top of the head to the back again; and so it continues crossing backwards and forwards until the whole top of the head is covered (Fig. 33), whilst the horizontal one has to hold it down, first in front and then behind, as often as it passes from one position to the other.

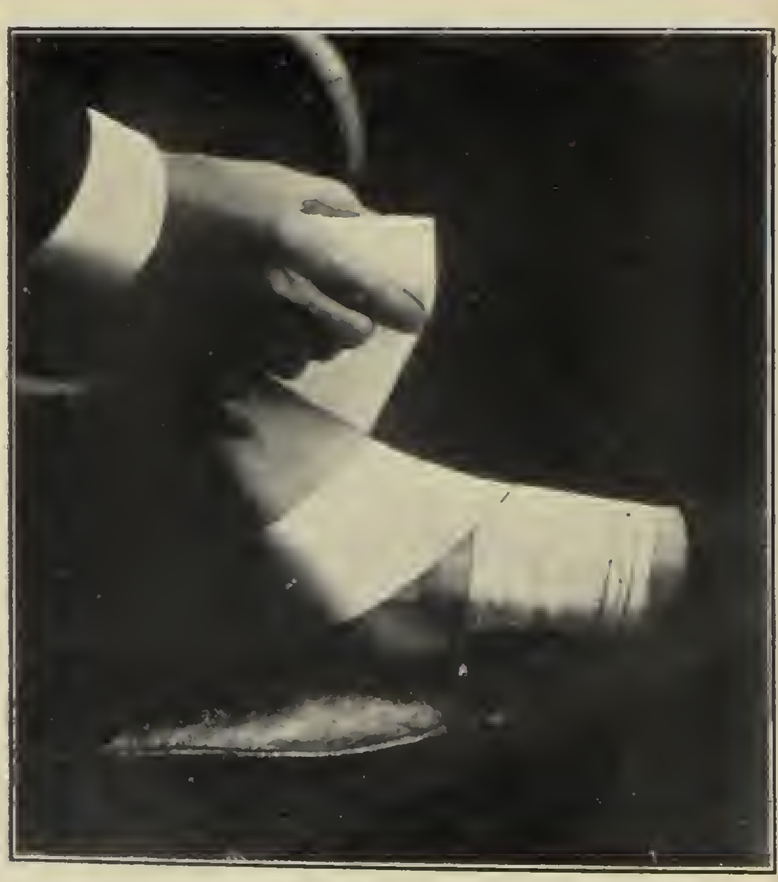

FIG. 34.

Figs. 34 and 35 show how the roller bandage is applied to the foot and ankle. The bandage must go round the ankle or it will not keep on the foot.

The first turns go round the ankle, then the succeeding ones alternately round the foot and ankle.

Notice in Fig. 34 that as the bandage crosses the front of the foot (or leg) the roll passes from the *inner* towards the *outer* side of the limb. This should be made a rule whenever a roller bandage is applied either to the upper or lower limb, namely, cross the front of the limb from the inner to the outer side, and not from the outer to the inner side.

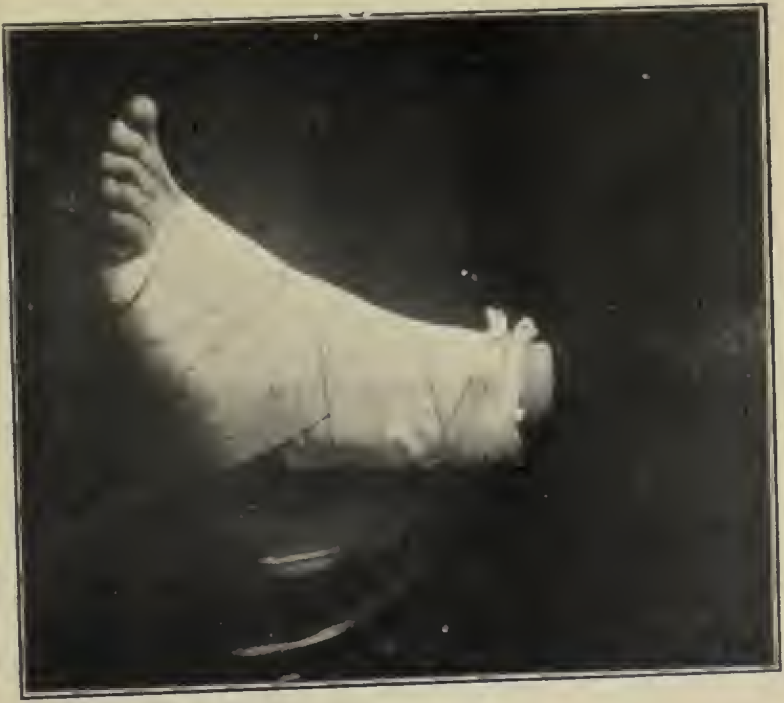

FIG. 35.

APPENDIX I

Beef Tea (*a*) *Ordinary*—

Take:	Gravy beef	1 lb.
	Water	1 pint.
	Salt	1 teaspoonful.

Remove all fat, cut the meat into small pieces, and place in a stone jar with the salt and water.

Let it stand one hour, stirring occasionally. Cover the jar and place in a covered saucepan containing two pints of boiling water and keep it boiling for five hours, adding more water to that in the saucepan as it gets lower. Strain.

Set aside to cool, and then remove fat from the surface.

Instead of placing the jar in a saucepan, it may be put in an oven, but then it will require an extra half pint of water.

(*b*) *Whole Beef Tea.*—Prepare exactly like the ordinary beef tea, but after straining, collect the residue from the sieve, pound it in a mortar, pass through a fine wire-sieve and add it to the beef tea.

This is more nutritious, but less digestible. Beef tea can be taken in combination with such other foods as yolk of egg, arrowroot and tapioca.

Veal Broth—

Take:	Knuckle of veal	1 lb.
	Water	3 pints.
	Rice	2 tablespoonfuls.

Cut the meat small.

Place the whole in a stew-pan.

Boil an hour and a half.

Flavour with parsley or thyme.

Mutton Broth—

Take :	Scrag of mutton . . .	3 lbs.
	Water	2 pints.
	One onion, two teaspoonfuls of salt, a sprig of parsley.	

Cut the meat up small, and chop the bone into pieces.

Put the lot into a saucepan and bring slowly to the boil, removing all scum as it rises.

Simmer slowly for four hours.

Strain through a hair-sieve and let it stand till cold.

Remove the fat with a spoon.

Rice or barley may be added.

Chicken Broth—

Take : One old fowl.
Water a sufficiency.
A little celery or parsley.
Salt and pepper to taste.

Remove the meat and cut it up. Chop up the bones. Cleanse the giblets.

Place the lot in a saucepan and cover with water.

Put on the lid and bring slowly to the boil, skimming until the broth looks clear.

Simmer four hours.

Strain through a hair-sieve : allow to cool and remove the fat.

Rabbit Broth may be prepared in the same way.

Whey.—The curd of milk can be separated by the addition of rennet, sherry wine, cream of tartar or lemon juice.

Two teaspoonfuls of essence of rennet, or the same quantity of lemon juice, or one teaspoonful of cream of tartar will curdle the milk, which should then be strained.

Barley Water.—Take pearl barley (washed in cold water), 2 ozs. Boil in water for five minutes and throw this water away. Then pour on the barley two quarts of boiling water and boil down to a quart or less. Don't strain. Flavour with lemon and sugar.

Tea.—China tea is best for invalids. It should not be infused for more than five minutes.

Brandy and Whisky.—It is *very* rarely that more than 3 ozs. of either of these has to be given to a patient *in twenty-four hours.* One teaspoonful every hour amounts to this maximum quantity (3 ozs.) in twenty-four hours. This of course is for an *adult ;* much less is necessary for a sick *child.*

The lightest wines (those containing the smallest percentage of alcohol) are clarets, then Burgundies. Port and sherry are much stronger, containing in fact nearly half as much alcohol as is found in spirits.

WEIGHTS AND MEASURES

There are 60 grains in a drachm weight.
,, 8 drachms in 1 ounce.

One drachm of most powders measures about a teaspoonful.

Liquid measure :—

There are 60 minims in one drachm.
,, 8 drachms ,, ounce.
,, 20 ounces ,, pint.

One *drop* of such sticky substances as glycerine measures more than one minim.

The drops of some substances (like chloroform) are *much* smaller than a minim (about three drops to the minim).

Therefore liquids should be measured.

One teaspoonful is about 1 drachm.
,, dessertspoonful ,, 2 drachms.
,, tablespoonful ,, 4 drachms.
,, ,, is equal to 4 teaspoonfuls.

8 teaspoonfuls or 2 tablespoonfuls should measure 1 ounce.

A wine-glass for claret or port will *just* hold 4 ozs. (8 tablespoonfuls). By a "tablespoonful" on the label of a bottle of medicine is meant half an ounce, and not a large heaped up tablespoonful.

APPENDIX II

HOW TO BECOME A NURSE

ANYONE desirous of becoming a professional nurse should decide at which Hospital she wishes to be trained, and then send a formal application in writing to the Matron.

She should state her age, and enclose—

1. A copy of a certificate from a medical man as to her health, and
2. One from a clergyman as to her character.

She should not be less than 23 years of age.

If there is a vacancy, the Matron may appoint a day for an interview.

The candidate will first enter the Hospital as a "Probationer," for a period varying from one to three months, according to the Hospital.

At the end of this period she will be examined by the Matron and a member of the medical staff, and, if found satisfactory, her regular training will begin.

The time spent in Hospital varies from one to four years, according to the Hospital and the financial arrangements.

The training of a Paying Probationer may be completed, so far as it goes, in one year, but she cannot leave the Hospital as a "fully trained" and "certificated" nurse without spending at least three years in Hospital.

Paying Probationers are received in many of the London Hospitals, but only in a few Provincial ones.

Those not entering as Paying Probationers may, after the end of the first year, receive a salary during the rest of the time they are receiving training, such payment varying from £12 to £20 per annum.

A knowledge of "Ambulance," "Nursing," "Hygiene" and sick cookery, such as is obtainable in connection with the "St John Ambulance Association" and "Evening Continuation Classes," is advisable, and will often facilitate the candidate's admission into Hospital.

As to uniform : the candidate has to provide all her own clothing for the first preliminary one to three months ; afterwards, indoor uniform is generally supplied by the Hospital authorities.

When outdoor uniform is worn, it also is supplied by the Hospital.

Workhouse Nursing.—Here, as a rule, the training is similar to that of General Hospitals, but the Probationer receives a salary from the commencement, beginning at about £18 and rising to £28 per annum.

The same is true of *Fever Hospital* training.

BIBLIOGRAPHY

Anderson, J., "Notes on Medical Nursing." (2s. 6d.)
Ashby, Henry, "Health in the Nursery."
Baker, Benson, "How to Feed an Infant." (1s. 6d.)
Beck, A. K., "Reference Handbook for Nurses." (5s.)
Bell, J., "Notes on Surgery for Nurses," 1906. (2s. 6d.)
Billroth, T., "The Care of the Sick," 1890. (2s. 6d.)
Bourneville, "Manuel Pratique de la Garde Malade et de l'Infirmière," 1889.
Brochard, Dr., "Practical Guide for the Young Mother" (Tr. from the French). (2s.)
Burdett, Sir H., "How to Become a Nurse," 1905. (2s.)
Burrows, H., "Surgical Instruments and Appliances Used in Operations," 1905. (1s. 6d.)
Cosgrave & Collie, "Hints and Helps for Home Nursing and Hygiene." (1s.)
Cullingworth, C. J., "Manual of Nursing, Medical and Surgical," 1889.
Cuff, H. E., "Lectures on Medicine to Nurses." (3s. 6d.)
Davis, Mary, "The Nurse's Companion in the Sick Room," 1888.
Davis & Douglas, "Eye, Ear, Nose and Throat Nursing." (5s. 6d.)
Dock, "Text-book of Materia Medica for Nurses." (3s. 6d.)
Drummond, W. B., "Golden Rules of Nursing." (1s.)
Eccles, "Elementary Anatomy and Surgery for Nurses."
Fenwick, B., "Nursing of Patients Suffering from Diseases of Chest." (5s.)
*Garrett, Elizabeth, "Volunteer Hospital Nursing," 1866.

Glaister, "Manual of Hygiene for Students and Nurses," 1905. (6s.)
Hadley, W. J., "Nursing: General, Medical and Surgical." (3s. 6d.)
Hampton, J. A., "Nursing: Principles and Practice." (7s. 6d.)
"Handbook for Attendance on the Insane." (2s.)
"Handbook of Nursing" (Connecticut Training Schools). (5s.)
Harding, W., "Fever Nursing," 1897.
Harding, W., "Mental Nursing," 1899.
Harrison, E., "Home Nursing." (4s. 6d.)
Haultain and Ferguson, "Handbook of Obstetric Nursing," 1902. (4s.)
Henderson, E., "The Nurse in Hot Climates." (1s.)
Hawkins, Ambler, "Gynecological Nursing," 1900. (1s.)
Howard, R., "Surgical Nursing." (6s.)
Humphrey, L., "Manual of Nursing." (3s. 6d.)
Jack Florence, "Art of Cooking for Invalids," 1898. (2s.)
* Johnson, R. W., "Some Friendly Cautions to Heads of Families, Containing Simple Directions to Nurses who Attend the Sick." By a Physician, London, 1767.
Kiniver, "Anatomy and Physiology for Nurses," 1905. (10s.)
Lewis, P. G., "Nursing, its Theory and Practice." (3s. 6d.)
Loane, M., "Outlines of Routine in Nursing." (1s. 6d.)
Lückes, Eva, "Home Nursing and Sick Room Appliances," 1883.
Lückes, Eva, "Hospital Sisters and their Duties," 1888. (2s. 6d.)
Macgregor, A. N., "System of Surgical Nursing." (9s.)
Madden, F. C., "The Practical Nursing of Infants and Children." (3s. 6d.)
Martin, J. W., "Questions and Answers on Nursing." (1s. 6d.)
Miles, A., "Surgical Ward Work and Nursing." (3s. 6d.)

Morten, Honnor, "Complete System of Nursing." (7s. 6d.)
Morten, Honnor, "The Midwives' Pocket-book," 1901. (1s.)
Morten, Honnor, "Dictionary of Medical Terms." (1s. 6d.)
Myers, B., "Home Nursing." (2s. 6d.)
Neale, "Medical Electricity and Light Treatment: A Practical Handbook for Nurses," 1905. (2s. 6d.)
Nightingale, Florence, "Notes on Nursing," 1896. (6d.) Two Articles on "Nursing" in Quain's Dictionary of Medicine.
Orme, Miss E., "Hospital and Private Nursing."
Oxford, M. N., "Handbook of Nursing," 1900. (3s. 6d.)
Parvis, "Obstetric Nursing."
Paul, G. P., "Nursing in Acute Infectious Fevers." (4s.)
Pollard, S. E., "Hints to Nurses on Tropical Fevers." (1s. 6d.)
Pringle, A. L., "Study in Nursing," 1905. (1s.)
Rathbone, W., "Sketch of the History and Progress of District Nursing from its Commencement in 1859 to 1890."
Roberts, R. L., "Illustrated Lectures on Nursing and Hygiene." (2s. 6d.)
Rose (Sister), "Nursing Notes on Midwifery and Gynecology," 1903. (2s.)
Sheen, A., "Nursing," 1892.
Smith, "Practical Guide to Surgical Bandaging and Dressing." (2s. 6d.)
Stacpoole, F., "Our Sick, and How to take Care of Them." (1s. 6d.)
Stephenson, S., "Ophthalmic Nursing."
Stewart & Cuff, "Practical Nursing," 1904. (5s.)
Stewart, Netta, "Gynecological Nursing," 1903 (2s. 6d.)
Stoney, E. A., "Practical Materia Medica for Nurses," 1899. (6s. 6d.)
Stoney, E. A., "Practical Point on Nursing," 1903. (7s. 6d.)
Stoney, E. A., "Bacteriology and Surgical Technique for Nurses," 1905. (6s. 6d.)

Thompson, "Notes on Pharmacy and Dispensing for Nurses," 1896. (1s.)
*Thompson, A. T., "Domestic Management of the Sick-Room," 1841.
Voysey, M. H. A , "Nursing Hints to Probationers." (2s.)
Walker, J. H., "Modern Nursing of Consumption." (1s.)
Watson, J. K., "Handbook for Nurses," 1901. (5s.)
Watson, J. K., "Examination of the Urine." (1s.)
Weatherley, "Lectures on Home Nursing." (1s.)
Weekes-Shaw, C. S., "Text-book of Nursing." (3s. 6d.)
Wilcox, R. W., "Manual of Fever Nursing." (4s. 6d.)
Woollacott, F. J., "Nursing of Infectious Diseases." (2s. 6d.)
Wood, C. J., "Handbook of Nursing." (2s.)
Yearsley, P. N., "Nursing in Diseases of the Throat, Nose and Ear." (2s. 6d.)

Those marked with an asterisk are amongst the earliest works on Nursing.

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